

# JVC

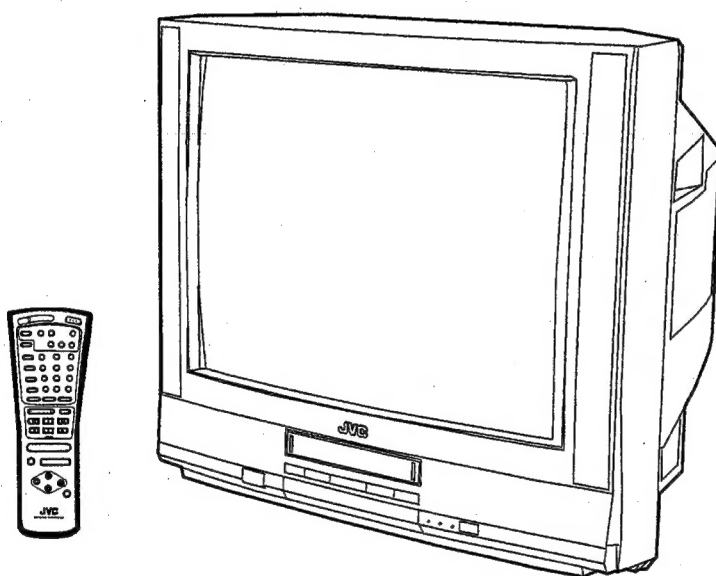
## SERVICE MANUAL

### COLOR TELEVISION

BASIC CHASSIS

FC

## TV-20240<sub>(US&CA)</sub>



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# SPECIFICATIONS

Items	Contents
<b>Dimensions (W × H × D)</b>	22-5/8" × 19-7/8" × 19-1/8" / 57.2cm × 50.3cm × 48.3cm
<b>Mass</b>	52.4 lbs / 23.8 kg
<b>TV RF System</b>	CCIR(M)
<b>Color Sound System</b>	NTSC, BTSC System (Multi Channel Sound)
<b>TV Receiving Channels and Frequency</b>	
VL Band	(02~06) 54MHz~88MHz
VH Band	(07~13) 174MHz~216MHz
UHF Band	(14~69) 470MHz~806MHz
<b>CATV Receiving Channels and Frequency</b>	
Low Band	(02~06, A-8) by (02~06&01)
High Band	(07~13) by (07~13)
Mid Band	(A~1) by (14~22)
Super Band	(J~W) by (23~36)
Hyper Band	(W+1~W+28) by (37~64)
Ultra Band	(W+29~W+84) by (65~125)
Sub Mid Band	(A8, A4~A1) by (01, 96~99)
<b>TV/CATV Total Channel</b>	181 Channels
<b>Intermediate Frequency</b>	
Video IF Carrier	45.75MHz
Sound IF Carrier	41.25MHz (4.5MHz)
<b>Color Sub Carrier</b>	3.58MHz
<b>Power Input</b>	120V AC, 60Hz
<b>Power Consumption</b>	100W (US) / 1.5A (CA)
<b>Picture Tube</b>	20" (50.8cm) Measured Diagonally
<b>High Voltage</b>	26.5kV ± 1kV (at zero beam current)
<b>Speaker</b>	1-4/5" × 4" / 4.5 × 10cm Oval type × 2
<b>Audio Power Output</b>	1.2W × 2
<b>Input</b>	
Video Input	1Vp-p, 75Ω (RCA pin jack)
Audio Input (R/L)	500mVrms ( -4dBs ), High Impedance (RCA pin jack)
<b>Antenna terminal</b>	75Ω (VHF/UHF) Terminal, F-Type Connector
<b>Remote Control Unit</b>	RM-C139-1A (AA battery × 2)

*Design & specifications are subject to change without notice.*

# OPERATING INSTRUCTIONS

# JVC<sup>®</sup>

## ***TV/VCR COMBO USER'S GUIDE***

**VHS SQPB**

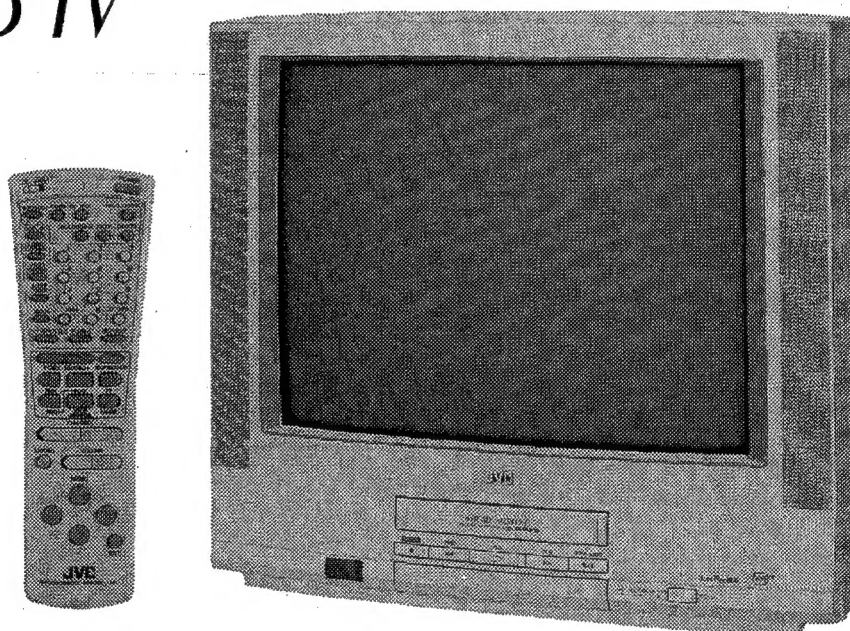
**Extra 19 $\mu$ m HEAD**

**4 HEAD (MONO)**



**STEREO TV**

## ***FOR MODEL TV-20240***



(Illustration of TV-20240 and RM-C139)

### **IMPORTANT NOTE TO THE CUSTOMER:**

Enter the serial number for your television  
(located on the rear of the television cabinet) on the space below.  
Staple your sales receipt or invoice to the inside cover of this guide.  
Keep this user's guide in a convenient place for future reference.  
Keep the carton and original packaging for future use.

Serial Number

# IMPORTANT SAFETY PRECAUTIONS

**CAUTION**  
**RISK OF ELECTRIC SHOCK**  
**DO NOT OPEN**

**CAUTION:** To reduce the risk of electric shock,  
Do not remove cover (or back).  
No user serviceable parts inside.  
Refer servicing to qualified service personnel.

The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING:** TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS TV SET TO RAIN OR MOISTURE.

**CAUTION:** TO INSURE PERSONAL SAFETY, OBSERVE THE FOLLOWING RULES REGARDING THE USE OF THIS UNIT.

1. Operate only from the power source specified on the unit.
2. Avoid damaging the AC plug and power cord.
3. Avoid Improper Installation and never position the unit where good ventilation is unattainable.
4. Do not allow objects or liquid into the cabinet openings.
5. In the event of trouble, unplug the unit and call a service technician. Do not attempt to repair it yourself or remove the rear cover.

Changes or modifications not approved by JVC could void the warranty.

\* When you don't use this TV set for a long period of time, be sure to disconnect both the power plug from the AC outlet and antenna for your safety.

\* To prevent electric shock do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

## IMPORTANT SAFEGUARDS

### CAUTION:

Please read and retain for your safety.

Electrical energy can perform many useful functions. This TV set has been engineered and manufactured to assure your personal safety. But improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards incorporated in this TV set, observe the following basic rules for its installation, use and servicing. And also follow all warnings and instructions marked on your TV set.

### INSTALLATION

- 1 Your TV set is equipped with a polarized AC line plug (one blade of the plug is wider than the other).

(POLARIZED-TYPE)



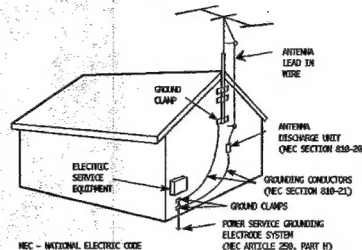
This safety feature allows the plug to fit into the power outlet only one way. Should you be unable to insert the plug fully into the outlet, try reversing the plug. Should it still fail to fit, contact your electrician.

- 2 Operate the TV set only from a power source as indicated on the TV set or refer to the operating instructions for this information. If you are not sure of the type of power supply to your home, consult your TV set dealer or local power company. For battery operation, refer to the operating instructions.
- 3 Overloaded AC outlets and extension cords are dangerous, and so are frayed power cords and broken plugs. They may result in a shock or fire hazard. Call your service technician for replacement.
- 4 Do not allow anything to rest on or roll over the power cord, and do not place the TV set where power cord is subject to traffic or abuse. This may result in a shock or fire hazard.
- 5 Do not use this TV set near water — for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near swimming pool, etc.

- 6 If an outside antenna is connected to the TV set, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection requirements for the grounding electrode.

- 7 An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE



- 8 TV sets are provided with ventilation openings in the cabinet to allow heat generated during operation to be released. Therefore:
  - Never block the bottom ventilation slots of a portable TV set by placing it on a bed, sofa, rug, etc.
  - Never place a TV set in a "built-in" enclosure unless proper ventilation is provided.
  - Never cover the openings with a cloth or other material.
  - Never place the TV set near or over a radiator or heat register.
- 9 To avoid personal injury:
  - Do not place a TV set on a sloping shelf unless properly secured.
  - Use only a cart or stand recommended by the TV set manufacturer.
  - Do not try to roll a cart with small casters across thresholds or deep pile carpets.
  - Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.

### USE

- 10 Caution children about dropping or pushing objects into the TV set through cabinet openings. Some internal parts carry hazardous voltages and contact can result in a fire or electrical shock.
- 11 Unplug the TV set from the wall outlet before cleaning. Do not use liquid or an aerosol cleaner.
- 12 Never add accessories to a TV set that has not been designed for this purpose. Such additions may result in a hazard.

- 13 For added protection of the TV set during a lightning storm or when the TV set is to be left unattended for an extended period of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to product due to lightning storms or power line surges.
- 14 A TV set and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the TV set and cart combination to overturn.



## SERVICE

- 15 Unplug this TV set from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - A. When the power cord or plug is damaged or frayed.
  - B. If liquid has been spilled into the TV set.
  - C. If the TV set has been exposed to rain or water.
  - D. If the TV set does not operate normally by following the operating instructions. Adjust only those controls that are covered in the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the TV set to normal operation.
  - E. If the TV set has been dropped or damaged in any way.
  - F. When the TV set exhibits a distinct change in performance — this indicates a need for service.
- 16 Do not attempt to service this TV set yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 17 When replacement parts are required, have the service technician verify in writing that the replacement parts he uses have the same safety characteristics as the original parts. Use of manufacturer's specified replacement parts can prevent fire, shock, or other hazards.
- 18 Upon completion of any service or repairs to this TV set, please ask the service technician to perform the safety check described in the manufacturer's service literature.
- 19 When a TV set reaches the end of its useful life, improper disposal could result in a picture tube implosion. Ask a qualified service technician to dispose of the TV set.

- 20 Note to CATV system installer.

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.



## PRECAUTIONS ABOUT VIDEO

Before operating the video unit, please read the precautions on this page.

### Precautions for Recording TV Programs About Copyright

The recordings you make from TV programs or pre-recorded tapes cannot be used without permission from the copyright holders, except when they are used solely for personal enjoyment.

### Trial Recording Before Making Important Recordings

Make a trial recording before an important program to be sure that you can record and playback audio and video properly.

### Disclaimer:

JVC assumes no liability for failure to record or playback audio and video properly with this unit.

### Precautions About Video Cassettes

Keep these points in mind while working with video cassettes.

#### Recording

- If you record on a previously recorded tape, the original content will be automatically erased.
- Video cassettes cannot be reversed or "flipped over" like audio cassettes.

#### Handling Cassettes Properly

- To store cassettes, place them inside their cases. The cases should then be stored vertically.
- Do not drop cassettes, or give them any other hard shock.
- Rewind cassettes before storing.
- Do not repeatedly load and unload tapes without running them in between.

#### Do Not Store in the Following Places

- Exposed to direct sunlight or near a heating device.
- Exposed to excessive humidity, smoke, or dust.
- Near a strong magnet (including speakers).

#### Prevent Accidental Erasure

Remove the small plastic tab at the rear of the cassette. Without this tab, the cassette cannot be used for recording. It is recommended that you remove the tabs from important cassettes to prevent accidental erasure. To record on a cassette whose tabs have been removed, cover the tab hole with two layers of adhesive tape.

### Precautions About Moisture Condensation

#### What is Moisture Condensation?

When you put cold water into a glass, water droplets form on its surface. This phenomenon is called moisture condensation.

#### If Moisture Condensation Occurs

The video unit may fail to operate, or may operate erratically potentially damaging the unit and video cassettes.

#### When Does Condensation Occur?

- When equipment is moved from a colder to a warmer place.
- Immediately after a room heater is started.
- When the unit is exposed to a cold air flow (like from an air conditioner)
- In high humidity or when steam is present.

#### To Prevent Condensation

- Wait about an hour before operating the unit so that it can become accustomed to the room conditions.
- Provide proper ventilation.

If the unit fails to operate or operates poorly and you think condensation may be the cause, turn the unit's power off and wait a few hours before trying to operate the unit again.

### Enjoying Clear Video Cleaning the Video Heads

After a long, or frequent use, the video heads inside the unit may become dirty, possibly resulting in poor picture quality. To prevent this from happening, it is recommended you clean the unit frequently with a head cleaning cassette (TCL-2 or 3, sold separately).

#### If Video Quality is Still Poor After Cleaning

Try cleaning the unit two or three times instead of just once. If the repeated cleaning still fails to produce better picture quality, an internal malfunction may be the cause. Call your local dealer for servicing.

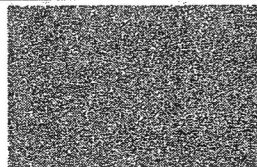
VCR Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.



Video Heads beginning to get dirty



Video Heads now fairly dirty



Video Heads totally clogged

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# 5 CONNECTIONS

## CONNECTIONS CHECKLIST — READ ME FIRST!

The Connections Checklist — Read Me First! section of this guide is a list of ideas to keep in mind when you set out to perform your connections. It is designed to help us not-so-technically-advanced individuals. If you read this section, and can't identify the plugs, connectors, and components you have, do not be afraid to seek help.

**1) Always refer to the connection instructions** in the user's guide for your components first! The manufacturer will provide the most detailed information about their products.

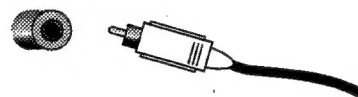
**2) Know your jacks and plugs** — most are color coded:

- Yellow plugs are Video connections
- Red plugs are Right Audio connections
- White or black plugs are Left Audio (Mono) connections (if your camcorder is a stereo model, use a stereo-to-monaural conversion cable to connect to the Combo unit. Conversion cables may be purchased separately.)

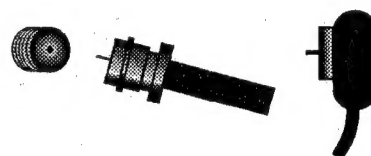
**3) Perform one hookup at a time.** If you have many accessories to connect, make sure each connection is correct by checking to see that it works properly before attempting the next connection.

**4) Unplug the power cord** between each connection.

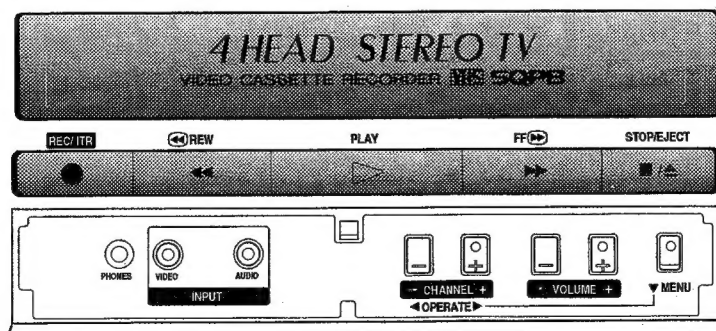
A/V input plug



RF Connectors

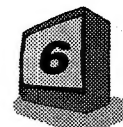


## FRONT PANEL DIAGRAM



TV-20240 Front Panel

# CONNECTIONS

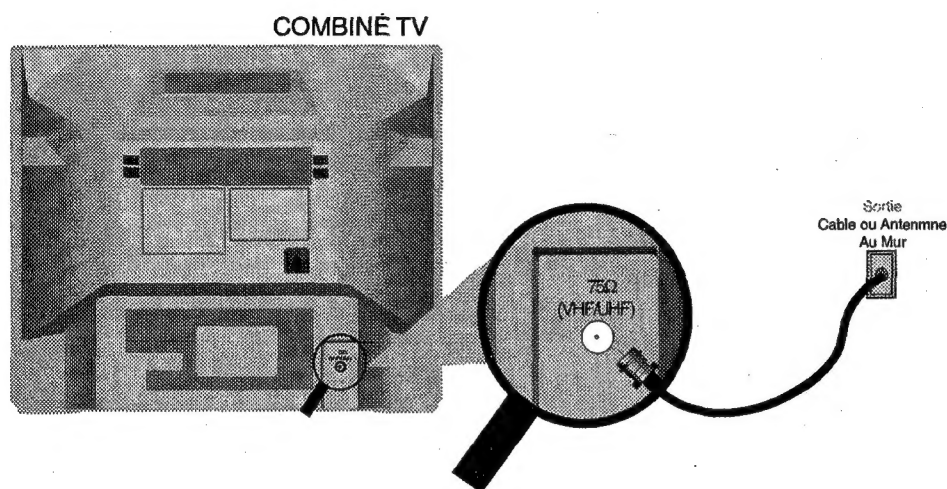


## CABLE BOX CONNECTION

There are two basic types of antenna/cable hook-ups. They are easy to distinguish.

### Type 1:

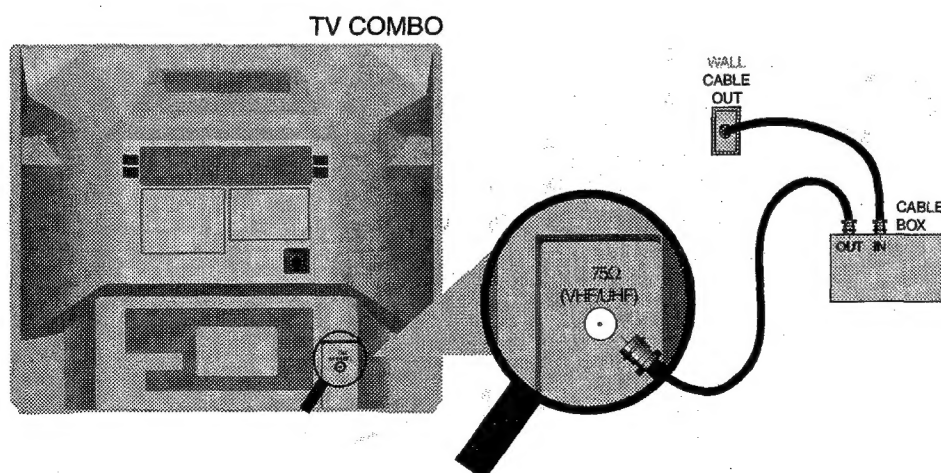
If you use an antenna or have a cable television system that does not require the use of a decoder box to receive signals, use the diagram below to connect your TV/VCR combo.



- 1) Connect the cable or antenna wire *out* from the wall *in* to the TV VHF/UHF input at the rear of the combo unit.
- 2) Plug the power cord into a nearby AC outlet.

### Type 2:

If you use a cable box to access any or all channels, use the diagram below.

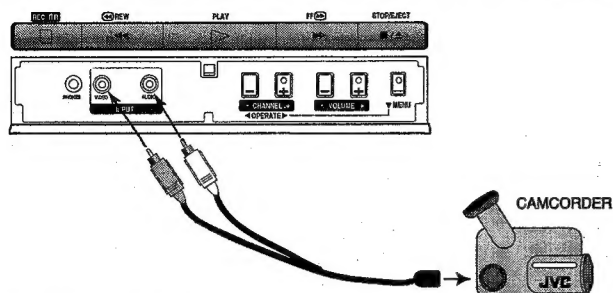


- 1) Connect the cable wire *out* from the wall *in* to the cable box RF input.
- 2) Connect an RF cable *out* from the cable box *in* to the TV VHF/UHF input.
- 3) Plug the power cord into a nearby AC outlet.



## CONNECTING TO A CAMCORDER

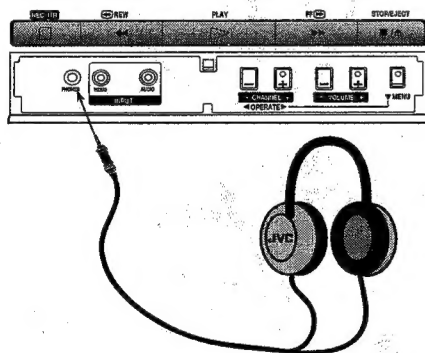
You can connect a camcorder right to your TV/VCR combo using the input jacks located at the front of the unit.



- 1) Press on the PUSH mark on the front panel door to open it.
  - 2) Connect a yellow video cable from the cam-corder output into the TV's Video input jack.
  - 3) Connect a white (or Black) Mono audio cable from the camcorder output into the TV's audio input jack.
- ☐ Refer to the camcorder's instructions for further information about the camcorder.

## CONNECTING TO HEADPHONES/EARPHONES

You can connect earphones or headphones to your TV/VCR combo using the input jack at the front of the unit.



- 1) Press on the PUSH mark on the front panel door to open it.
  - 2) Insert the earphone/headphone plug into the phones input jack.
- ☐ Refer to the headphones or earphones instructions for further information.

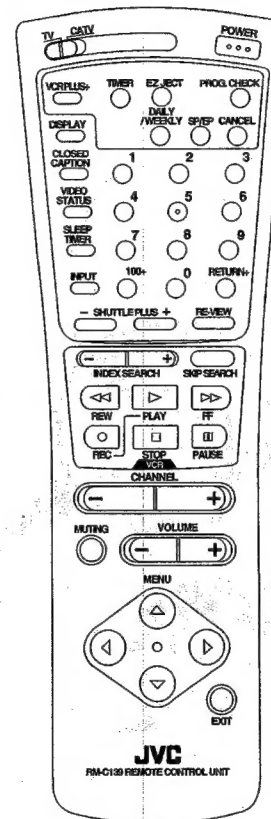
No.51520



## REMOTE CONTROL

# RM-C139

RM-C139  
TV-20240



## CHANGING THE BATTERIES

Be sure to use only size AA batteries.

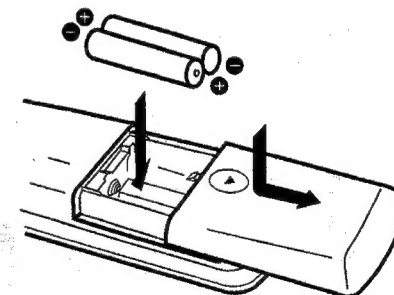
- 1** Push down on the remote's back cover and slide towards the bottom to remove it.
- 2** Insert the two supplied AA batteries, carefully noting the "+" and "-" markings on the batteries and remote control. To avoid a short circuit, insert "-" end first.
- 3** Snap the cover back into place.

☐ If the remote control acts erratically, replace the batteries.  
Typical battery life is usually about one year.

☐ We recommend alkaline batteries for a longer battery life.

## NOTE:

When you change the batteries, try to complete the task within 3 minutes. If it takes longer than 3 minutes, the remote control codes for your Cable box will have to be reset (page 10).



RM-C139



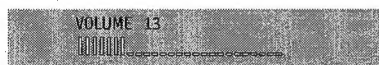
## GETTING STARTED

### POWER

- ☐ Press the Power button on the remote control or the TV/VCR combo front panel. The On Timer lamp will glow red.
- ☐ Make sure that the TV/CATV switch on the remote is set to TV. Switch to CATV only if you plan to operate a cable box. If you switch to CATV you will not be able to operate the TV/VCR combo functions with the remote, only the cable box functions!
- ☐ To turn the power off, press the POWER button again. The On Timer lamp will go out.
- ☐ The On Timer lamp will glow green when the On/Off Timer is set to yes, even when the TV power is off.

### ADJUSTING VOLUME

- 1** Adjust the volume with the VOLUME +/- buttons on the TV/VCR combo front panel or on the remote control. Press the VOLUME - button to lower the volume. Press the VOLUME + button to raise the volume.



- 2** Press the Muting button to instantly turn the volume off to zero. To restore the volume to the previous volume level, simply press the Muting button again.

### CHANGING CHANNELS

- 1** 10 key direct access.

Press the numbers on the remote's 10 key pad. For single-digit channel numbers press 0 then the number. For channels above 100, press the 100+ button plus the 2-digit number.

- 2** CHANNEL +/- button.

Press the CHANNEL +/- button, to scan the channels in order.

- ☐ After you operate the Auto Tuner Setup (page 12), all of the blank, or empty, channels will be removed from scanning so that there is no noise or channel snow when you scan, only active channels.

- 3** Return.

Press the RETURN button to return to the previous channel. First, select a channel (game #1). Then, select another channel (game #2) with the 10 key pad and push the RETURN button to flip directly back and forth.

## REMOTE PROGRAMMING



### SETTING THE CATV CODES

Many CATV brands have more than one code. If the first code in the list does not work, try the other codes listed. If your CATV box does not respond to any of the codes listed for the manufacturer, use the remote control for the CATV box to operate it.

#### CABLE BOX OR SATELLITE SETUP

The remote is programmed with the CATV and Satellite codes for power on and off, 10 key, and channel up and down.

- 1) Determine the correct code from the "CATV & Satellite Codes" chart below.
- 2) Slide the 2-Way Mode Selector Switch to CATV.
- 3) Press and hold down the DISPLAY button.
- 4) Enter the 3-digit code with the 10 key pad while continuing to hold down the DISPLAY button.
- 5) Release the DISPLAY button.
- 6) Confirm the operation of the cable box.

### CATV & Satellite Codes

CABLE BOXES	CODES	CABLE BOXES	CODES	CABLE BOXES	CODES
ABC	035 001 011 002 009 033 091 055	Memorex	007	Starquest	004
Antronix	044	Movietime	032 039 029 042 044 088 040 038 060	Sylvania	019 035
Archer	029 001 044 088 091 063 042 030 052 076	NSC	038 040 032	Tandy	062
Belcor	062	Oak	011 046 010 012 047	Teknika	074 054
Cable Star	062	Panasonic	016 017	Telecaption	092 077
Cabletenna	029 001 044 088 091 076	Paragon	007	Televue	032 040 042 078 094
Cableview	063 044 042 030 052 088	Philips	013 020 023 024 096 030 084	Texscan	018 019 035
Century	063 044 042 030 052 088	Pioneer	005 006 078	Tocom	033 034 048 049 001 042 091 073
Citizen	063 044 042 030 052 088	Popular Mechanics	059	Toshiba	036 007 066 070
Colour Voice	023	Pulsar	063 044 042 030 052 088 007	Tusa	004
Comtronics	042 021	Quest	001 002 003 004 034 055 083 085 091 093 095	TV86	040
Contec	010	RCA	016 017	Uniden Satellite	065 069
Curtis	008 009 056 061 087 090	Realistic	051 044 088 053	Unika	029 001 044 088 091 063 042 030 052 076
Diamond	029 001 044 088 091 076	Recoton	059 063 044 042 030 052 088	United Artists	011
Drake	037 067 071	Regal	014 041	United Cable	001
Eagle	013 022 058 062 020 040 026 021	Regency	028 099	Universal	042 043 044 052 063 088 082
Eastern	028 099	Rembrandt	032 039 029 042 044 088 002 060	Videoway	007 050 023 045
Focus	059	Runco	007	Vid Tech	064
GC Electronics	063 044 042 030 052 088 082	Salora	068 072	Vidlar	084
Gemini	004 065 032 030	Samsung	016 017 006 032 040 042 078 094	Viewstar	013 022 058 062 020 040 026 021
General Electric	057	Scientific Atlanta	008 009 056 061 087 090	Zenith	007 050 023 075
General		Sheritech	027	Zentek	059
Instruments	001 002 003 004 034 055 083 085 091 093 095	Signal	013 022 058 062 020 040 026 004 042 032 078 094 021 038 002		
Gerrard	063 044 042 030 052 088	Signature		SATELLITE	CODES
Hamlin	014 015 028 041 099	SL Marx	032 040 042 078 094 063 044 030 052 088	RCA	097
Hitachi	031 079 002 080	Sprucer	016 017	Sony	098
Hytex	011	Standard		Gradiente	100
Jerrold	001 002 003 004 034 055 083 085 091 093 095	Components	032 039 029 042 044 088 018 060 063 052 030		
Macom	031 079 060	Starcom	001 004 055		
Magnavox	025 026 013	Stargate	032 040 042 078 094 004 063 044 030 052 088		
Matsushita	016 017				





## USING THE MENU

### USING THIS GUIDE:

Throughout this guide there are certain symbols we use as shorthand to show you what to do. When you see them, keep these factors in mind:

- ▲▼ Up and down arrows mean press the MENU Up or MENU Down buttons. Pressing the up or down buttons allows you to:

- Move vertically in the main menu screen
- Move through a submenu, or
- Move to the next letter, number, or other choice in a submenu, or
- Back up to correct an error

- ◀▶ Left and right arrows mean press the MENU Left or MENU Right button to:

- Select the highlighted item, or
- Select the options in a submenu



The "Press Button" means you should press that button on the remote control



The "Helping Hand" points to the highlighted or selected item in a menu.

- Important information, or a note, about a feature follows a cube like this one.

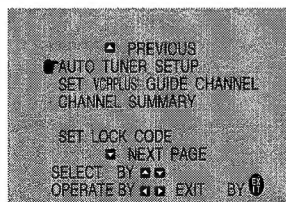
SMALL CAPITAL LETTERS are used when we refer to buttons ... this is important because some menu functions have the same name.

### THE ONSCREEN MENUS:

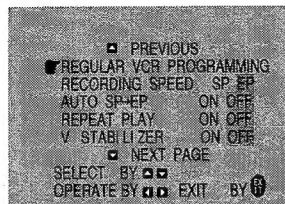
To bring up the onscreen menu, press the MENU button on the remote, and the menu will appear on the screen. The "Helping Hand" will appear next to an item that is selected.

When you first turn on the TV, the "Picture Settings" menu will appear. However, "Initial Setup" is so important, that this guide begins here.

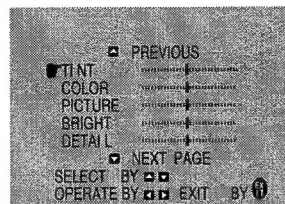
### INITIAL SETUP ITEMS



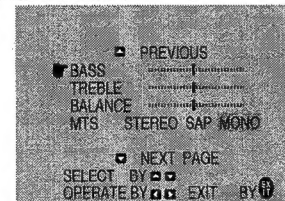
### VCR SETUP SETTINGS



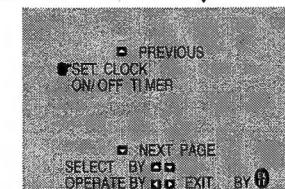
### PICTURE SETTINGS



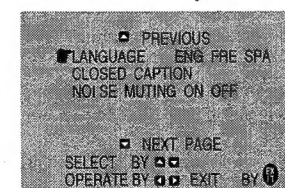
### SOUND SETTINGS



### TIMER SETUP ITEMS



### GENERAL ITEMS



## INITIAL SETUP



### AUTO TUNER SETUP

During Auto Tuner Setup, the TV will automatically scan through all available channels and memorize the active ones so that when you scan, you do not pick up weak or noisy channels.



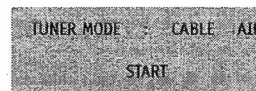
Press any MENU button



To AUTO TUNER SETUP



To operate



To choose CABLE or AIR



To move to START



To start Auto Tuner Setup



The Programming takes approximately 1 to 2 minutes



**Note:** Noise Muting will not work while Auto Tuner Setup is working.

### CHANNEL SUMMARY

You can add or delete channels from channel scanning. You can also lock out any "unauthorized" viewers from one or up to all 181 channels.



Press any MENU Button



To CHANNEL SUMMARY



To operate

**Note:** Noise Muting will not work while you are in the Channel Summary menu.

### SCAN

You can manually set channels to scan that were too weak to be picked up during Auto Tuner Setup. Conversely, if a channel was too weak to receive a good picture but was picked up anyway, delete it by removing the √. (If you have not performed the Auto Tuner Setup described in the previous column, please do so now.)

CH NO	SCAN	CH NO	SCAN
01		06	√
02	√	07	
03	√	08	
04	√	09	√
05	√	10	√



CHANNEL +/- to select the channel



To the SCAN column



To add or delete from scan



EXIT when finished

**Note:** Channels set to scan will be marked with an √.

**Note:** Some cable systems experience interference from radio frequencies on Cable Channel 95. If you like, you can delete this channel from scanning by removing the √

### NOTES:

During Initial Setup, the TV will be programmed to only receive active channels. Once the channels are activated by the Auto Tuner Setup, they will be included in Scan.

Some weak channels may be included or omitted during this procedure. You can add or delete any channels from scanning in the Channel Summary.

Continued next page ...



## INITIAL SETUP

Continued ...

### CHANNEL GUARD - LOCK

- ▲▼ To CHANNEL SUMMARY
- ◀▶ To operate
- CHANNEL +/- to select the channel
- ▲▼ To the Lock column
- The access code zero (0) to lock or unlock that channel

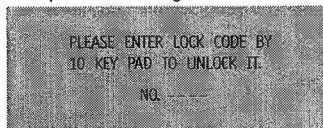
CH NO.	SCAN	LOCK	CH NO.	SCAN	LOCK
01			06	✓	
02	✓		07		
03	✓		08		
04	✓		09	✓	
05	✓		10	✓	

Exit when finished

**Note:** When viewing, once the Channel Guard for a specific channel has been unlocked, that channel will remain unlocked until power to the television is turned off. To reactivate Channel Guard, turn the power off and then on again.

### CHANNEL GUARD MESSAGE:

This message appears when a viewer attempts to watch a guarded channel:



To watch a channel you have locked, enter the lock code using the 10 key pad. An explanation of how to set the lock code appears in the next column on this page.

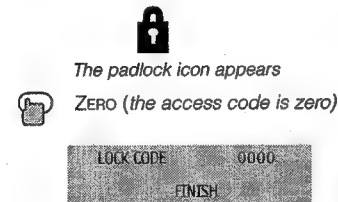
If the wrong lock code is entered, this message will flash on the screen:



### SET LOCK CODE

The Lock Code locks and unlocks Channel Guard settings. Write this four digit number down and keep it safe from potential viewers!

- Press any MENU button
- ▲▼ To SET LOCK CODE
- ◀▶ To operate



- ◀▶ To choose the number
- ▲▼ To move to the next place
- Continue to follow these directions for all four numbers
- ▲▼ To FINISH
- ◀▶ To save settings and exit
- Exit when finished

**Note:** If you forget your Lock Code you can check your code by going to the setup screen of the Set Lock Code function.

**Note:** After a power interruption of more than 90 seconds you must reset the lock code.

## INITIAL SETUP



### VCR PLUS+ GUIDE SETUP

Continued...

Below is the VCR Plus+ Guide Setup Menu

GUIDE CH	TV CH	GUIDE CH	TV CH
01	01	06	06
02	02	07	07
03	03	08	08
04	04	09	09
05	05	10	10

CHOIX PAR SORTIR PAR

▲▼ To move to a TV CH position which corresponds to a particular GUIDE CH number

◀▶ To Select a receivable TV CH  
Repeat the steps described above until all receivable channels have been set.

Exit to save settings and exit.

Your TV/VCR Combo is now ready to accept VCR Plus+ codes.

#### NOTES:

VCR PLUS+ codes for individual television programs can be found in most local newspaper television listings and TV magazines.

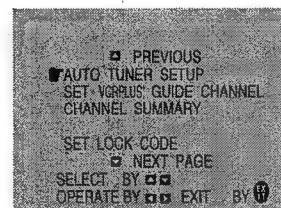
### VCR PLUS+ GUIDE SETUP

You may simplify the recording of television programs by using VCR PLUS+ codes to program your VCR. Whenever you want to record a program, all you need to do is find the VCR PLUS+ code for that program. After entering the code, the TV/VCR Combo will automatically record the program at the correct date, time, and channel.

Before using VCR PLUS+ for the first time, you need to set local channels for VCR Plus+. These guide numbers may be found in your local TV magazine or newspaper's TV listings.

#### To Set Local Channels for VCR PLUS+

Press any of the menu buttons to display the Initial Setup screen



▲▼ To Select SET VCR PLUS+ GUIDE CHANNEL

◀▶ To display the SET VCR PLUS+ GUIDE CHANNEL menu screen



## PICTURE SETTINGS

### NOTES:

If you do not move to the next setting with the up and down arrows, in approximately three seconds the screen will disappear and your preferences will be stored.

You can exit the Picture Settings menu at any time by pressing the Exit button on the remote control.

### TINT

Tint allows you to adjust the levels of red and green in the picture.

- Press any Menu button
- To TINT
- To accentuate green
- To accentuate red
- To move to the next

### COLOR

Color allows you to adjust both the vividness and subtlety of the color.

- Press any Menu button
- To COLOR
- To make colors more vivid
- To subdue colors
- To move to the next or previous

### PICTURE

Picture allows you to adjust the range between black and white in the picture.

- Press any Menu button
- To PICTURE
- To increase contrast
- To decrease contrast
- To move to the next or previous

### BRIGHT

Adjust the degree of light and dark in the picture.

- Press any Menu button
- To BRIGHT
- To lighten the picture
- To darken the picture
- To move to the next or previous

### DETAIL

Detail allows you to adjust the level of detail within the picture.

- Press any Menu button
- To DETAIL
- To make the picture sharper
- To make the picture smoother
- To move to the previous

### BASS

The Bass level adjustment feature allows you to raise or lower the level of lower frequencies in the TV's sound.

- Press any Menu button
- To BASS
- To emphasize bass
- To reduce bass
- To move to next

### TREBLE

The Treble level adjustment feature allows you to raise or lower the level of higher frequencies in the TV's sound.

- Press any Menu button
- To TREBLE
- To increase treble
- To decrease treble
- To move to next

### BALANCE

The Balance adjustment feature allows you to center the TV's sound to your needs.

- Press any Menu button
- To BALANCE
- To shift the speaker balance to the right
- To shift the speaker balance to the left
- To move to next

## SOUND SETTINGS



### NOTES:

MTS has no effect on normal sound broadcasts.

You can exit the Sound Settings menu at any time by pressing the Exit button.

### MTS (Multi-Channel Television Sound)

MTS technology gives you a choice among stereo, mono, and Second Audio Programs (SAP).

- Press any Menu button
- To MTS

MTS STEREO SAP MONO  
ON AIR

- Select the mode

(The ON AIR arrow tells you if the current signal contains Stereo or SAP)

**Note:** Keep the TV in STEREO mode to get the fullest sound quality.

**Note:** SAP will allow you to hear an alternative soundtrack, if available.

**Note:** Choose MONO to reduce excess noise in a program or channel.

### Some Sound Advice

You can tell if a program is broadcast in stereo by the position of the ON AIR arrow in the MTS menu. Unfortunately, it is common for some cable companies to squash the transmission of stereo programs to mono because they only have mono equipment. If connected to a cable system, the sound is at the mercy of that cable company — if they broadcast in mono, you receive mono sound regardless of the original stereo programming.

Fortunately, most programs that are broadcast in stereo are aired on the major television networks. If you connect your TV to an antenna instead of cable, and set the tuner mode in the Auto Tuner Setup to "Air" instead of "Cable," you will be able to pick up stereo broadcasts in stereo.



## CLOCKS/TIMERS

### NOTES:

To use the Semi-Auto function, first tune the television to your local PBS station. PBS stations transmit the EDS or XDS signal needed to set the clock.

### DAYLIGHT SAVINGS TIME

This function automatically adjusts for Daylight Savings time. At 2:00 am on the first Sunday in April, the clock moves forward one hour. At 2:00 am on the last Sunday in October the clock moves back one hour.

### POWER OUTAGE

If the TV is unplugged or you experience a power outage of more than 90 seconds, you must reset the clock in order for any of your timer functions to work.

If power is interrupted for less than 90 seconds, the clock will continue to run, but will be delayed the length of the power interruption (for example if the power was interrupted for 45 seconds, the clock will be 45 seconds slow). It is best to check the clock after any interruption in power.

### SET CLOCK (SEMI-AUTO)

The Clock is the heart of all timer functions. You must set the clock before any timer functions will work. Your clock can be set automatically by using a broadcast signal available in most areas.



Press Channel +/- to go to your local PBS station (These stations carry the EDS or XDS time signal)



Press any of the Menu .

▲▲ To SET CLOCK

◀◀ To operate

◀◀ To choose SEMI-AUTO

MODE	SEMI-AUTO	MANUAL
TIME	---	---
DATE/YEAR	---	---
D.S.T.	ON	OFF
START CLOCK		
SELECT	BY	BY
OPERATE	BY	BY

▲▲ To move to time zone

◀◀ To set the time zone

← ATLANTIC ↔ EASTERN ↔ CENTRAL ↔ MOUNTAIN →  
← HAWAII ↔ ALASKA ↔ PACIFIC →

▲▲ To move to D.S.T. (Daylight Savings Time)

◀◀ To turn D.S.T. ON or OFF

▲▲ To move to FINISH

◀◀ To exit and save settings

### CLOCK SET MESSAGE

If you do not set the clock but attempt to use a timer function anyway, you will get the following message:

PLEASE SET CLOCK FIRST!!		
MODE	SEMI-AUTO	MANUAL
TIME	---	---
DATE/YEAR	---	---
D.S.T.	ON	OFF
START CLOCK		

### SET CLOCK (MANUAL)

If you are in an area that does not receive the EDS or XDS signal needed for the Set Clock (Semi-Auto) function, or if you wish to set the clock to a different time, use the manual function.



Press any Menu button

▲▲ To SET CLOCK

◀◀ To operate

◀◀ To choose MANUAL

MODE	SEMI-AUTO	MANUAL
TIME	---	---
DATE/YEAR	---	---
D.S.T.	ON	OFF
START CLOCK		
SELECT	BY	BY
OPERATE	BY	BY

▲▲ To move to hour

◀◀ To set the hour (AM/PM)

▲▲ To move to minutes

◀◀ To set the minutes

▲▲ To move to month

◀◀ To set the month

▲▲ To move to date

◀◀ To set the date

▲▲ To move to year

◀◀ To set the year

▲▲ To move to D.S.T.

◀◀ To turn D.S.T. ON or OFF

▲▲ To Move to START CLOCK

◀◀ To start the clock

THANK YOU !!

If you want to synchronize the TV clock with another clock or time signal, press LEFT or RIGHT MENU arrow at the appropriate time, and the clock will start at that moment.

## CLOCKS/TIMERS

Notes for Canadian customers regarding the clock feature of the TV-20240

\* Veuillez vous reporter au verso de cette feuille pour une version française de ces notes.

### SET CLOCK (SEMI-AUTO)

The Set Clock (Semi-Auto) feature uses the XDS or EDS time signal to set the internal clock of the TV/VCR Combo. It is accessed from the menu below. (Please see page 17 of the Instruction Book for a full explanation of setting the clock of the TV/VCR Combo).

MODE	SEMI-AUTO	MANUAL
TIME	---	---
DATE/YEAR	---	---
D.S.T.	ON	OFF
START CLOCK		
SELECT	BY	BY
OPERATE	BY	BY

Set Clock - Semi-Auto menu screen

The XDS and EDS signals are carried only by certain broadcast television stations (for example, the signal is carried by most Public Broadcasting Service stations). You must be able to receive a station carrying the XDS or EDS signal to use the Semi-Auto feature to set your TV/VCR's internal clock. If you live in an area that does not broadcast XDS or EDS signals, you must set the clock manually. Please see page 17 for instructions on how to manually set your TV/VCR's clock.

### Special note for residents of Newfoundland.

The Set Clock (Semi-Auto) feature cannot be used to set the TV/VCR's internal clock to Newfoundland time. The time zone command does not include a setting for the Newfoundland time zone. Trying to use the Semi-Auto feature in the Newfoundland time zone could result in an incorrect time setting or no setting at all. Please set your TV/VCR's clock using the Set Clock - Manual feature.

MODE	SEMI-AUTO	MANUAL
TIME	---	---
DATE/YEAR	---	---
D.S.T.	ON	OFF
START CLOCK		
SELECT	BY	BY
OPERATE	BY	BY

Set Clock - Manual menu screen

Detailed instructions on how to manually set the clock may be found on page 17 of your TV/VCR's Instruction Book.

**ON/OFF TIMER**

Use the On/Off Timer as an alarm to wake up, as a program reminder, or as a decoy when you're out of the house.



Press any MENU button

▲▼ To ON/OFF TIMER

◀▶ To operate

ON TIME	7:00	PM
OFF TIME	10:00	PM
CHANNEL	02	
MODE	ONCE	EVERYDAY
ON/OFF TIMER	YES	NO
FINISH		

◀▶ To set the hour (AM/PM) you want the TV to turn on

▼ To move to minutes

◀▶ To set the minutes

▼ To accept ON TIME and to move to OFF TIME (set time for TV to turn off)

▼ To move to CHANNEL

◀▶ To select channel

▼ To move to MODE

◀▶ Choose ONCE or EVERYDAY

▼ To YES NO

◀▶ Choose YES for on, NO for off

▼ To FINISH

◀▶ To save settings



Exit when finished

**Note:** In order for ON/OFF Timer to work, the clock must be set. After a power interruption of more than 90 seconds timer settings will be turned off and will need to be reset.

**Note:** ON/OFF Timer cannot be set to locked or guarded channels.

**LANGUAGE**

Choose from English, French, or Spanish on-screen menus and displays.



Press any MENU button

▲▼ To LANGUAGE

LANGUAGE	ENG	FRE	SPA
----------	-----	-----	-----

◀▶ To choose a language



Exit when finished

**CLOSED CAPTION**

If they are included in a program, you can view closed captions or text information.



Press any MENU button

▲▼ To CLOSED CAPTION

◀▶ To operate

CAPTION:	CC1	CC2	CC3	CC4
TEXT:	T1	T2	T3	T4
FINISH				

▲▼ To CAPTION or TEXT

◀▶ To select a caption or text channel

▲▼ To FINISH

◀▶ To save settings and exit

**Note:** See page 25 for details on accessing closed captions with the Closed Caption button on your remote control.

**Note:** Closed captioning may not correctly operate when the signal received is weak or when you are playing a video tape.

**NOISE MUTING**

Eliminates noise from channels that are not broadcasting or are too weak.



Press any MENU button

▲▼ To NOISE MUTING

◀▶ To turn ON/OFF

**Note:** Noise Muting will not work when you operate Auto Tuner Setup or Channel Summary.

**NOTES:****Closed Caption**

**Notes:** Captions are usually found on CC1 and text on T1. The other caption and text channels are available but are for future purposes. If you want to view captions or text, most likely you should choose CC1 for Captions and T1 for Text.

To access a captioning option or to turn one off, allow the display to remain on screen until it disappears. In a few seconds, the captions will start.

If a large black box covers 80% of the screen, the Text Mode is probably "On". Press the Closed Caption button to turn it off.

**General Note:** You can exit the menu at any time by pressing the Exit button.

**NOTES:**

The TV/VCR combo can record and play back video cassettes in monaural sound only.

This TV/VCR combo is equipped with SQPB (S-VHS QUASI PLAYBACK) which lets you watch tapes recorded in the S-VHS format.

SQPB does not deliver S-VHS resolution.

S-VHS recording is not possible with this video recorder.

You can watch a different program than the one being recorded by the VCR. Press the CHANNEL +/- button or use the 10-key pad to switch to a different channel. You may also return to the recording channel at any time.

**VCR BASICS**

This section of the guide will explain the many functions of the VCR portion of your new TV/VCR Combo. We will begin with a basic explanation of how to load, view and eject a video cassette.

**LOAD A VIDEOCASSETTE**

Make sure the "window" of the video cassette is facing up, and the rear label of the video cassette is facing you. Insert the cassette into the slot below the television screen by pressing on the rear of the cassette. Do not use too much pressure when inserting. If the tab at the rear of the cassette has been removed, playback of the tape will begin automatically.

**CAUTION!**

To avoid injury, do not place your hand inside the video cassette slot of the VCR or your hand may be caught by the unit's internal mechanism. Take special care to prevent children from inserting their hands into the VCR.

**FIND THE START OF THE PROGRAM**

If the tape is not set at the start of the program, you can move backwards on the tape by using the REW button on the remote or TV/VCR combo front panel. Press REW to rewind the tape to the desired point. To advance forward on the tape, press the FF button.

**START PLAYBACK**

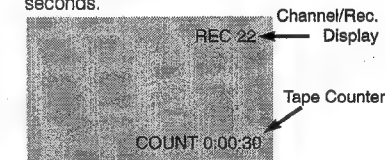
To begin viewing a video cassette, press the PLAY button on the remote or on the TV/VCR combo front panel. A video picture will appear.

**STOP PLAYBACK**

To end playback of the video cassette, press the STOP button on the remote or the STOP/EJECT button on the TV/VCR combo front panel. The video playback will stop and the on screen display will automatically switch to the television (or to LINE if LINE INPUT is selected).

**SIMPLE RECORDING**

To record a television program, first select the channel airing the program you wish to record using the 10-digit key pad or CHANNEL +/- buttons on the remote control. Next, press the SP/EP button to select the recording speed (for more on recording speeds see page 20). To begin recording, press the PLAY button while holding down the REC button. The following display will appear on screen over the television picture for a few seconds.



When the program is over, press STOP to finish recording.

**TAPE COUNTER**

The Tape Counter appears on screen when you fast forward or rewind as a guide to show how much tape is left on a cassette. It also appears when you begin recording or playback. To see the tape counter display at other times, press DISPLAY. For more on DISPLAY, see page 24. To reset the counter, press CANCEL on the remote.

**EJECTING THE CASSETTE**

To remove a cassette from the unit, press the STOP/EJECT button on the TV/VCR combo front panel. The... mark will begin to flash and the cassette will be ejected from the unit.



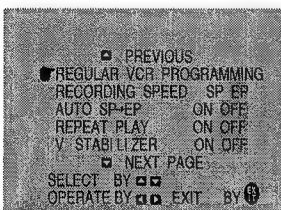
**VCR MENU**

The VCR Menu screen gives you a number of options for operating your VCR. For an explanation of how to use on screen menus, see page 11. \*Press any of the Menu buttons to display the menu screen.

**REGULAR VCR PROGRAMMING**

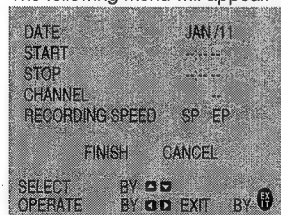
This function lets you manually input the time, date and channel information for a program you wish to record. (To program your VCR using VCR Plus+ codes see page 22)

- ▲▼ To REGULAR VCR PROGRAMMING



- ◀▶ To operate

The following menu will appear.



- ◀▶ To select DATE  
 ▲▼ To START (hour AM/PM)  
 ▲▼ To set the time you wish the VCR recording to begin.  
 • When you press the Right or Left arrow button, the current time is first displayed.  
 ▲▼ To STOP  
 ▲▼ To set the time you wish the VCR recording to end

- ▲▼ To CHANNEL  
 ▲▼ To select the channel of the program you wish to record.  
 ▲▼ To RECORDING SPEED  
 ▲▼ To select the recording speed.  
 • SP - select to record at standard speed.  
 • EP - select to record at 1/3 normal speed.  
 ▲▼ To move to FINISH  
 ▲▼ To exit programming and save your settings. The following message will appear:

YOUR PROGRAM IS CONFIRMED  
 PUSH THE TIMER BUTTON

- The TIMER button on the remote control. The timer is now in standby

The REC lamp will glow green on the front panel of the unit, indicating the timer has been programmed. When the programmed start time arrives, the REC lamp will glow red and recording will begin. When the programmed stop time arrives, the lamp will go out and the recording will automatically stop.

**Note:** After recording if there are other pre-set programs the lamp will turn green.

**Notes on overlapping programs:**  
 If the timer is set to record two different programs with overlapping times, the second recording will not start until the first is finished. For example if one timed recording is set to run from 5:00 to 6:00, and a second is set from 5:30 to 7:00, the second recording will not start until 6:00 when the first finishes. If one program entirely overlaps another - program 1 is from 5:00 to 6:00, program 2 is from 5:30 to 6:00 - the second program will not record.

**NOTES:****Recording speeds**

This VCR allows for recording and playback at two different tape speeds.

SP - Standard Play. This setting gives the best recording and playback qualities. It is the time length indicated on blank video cassettes.

EP - Extended Play. This setting records and plays back at 1/3 the SP speed (for example a 120 minute cassette can record for six hours at the EP setting). However, video and audio quality at EP speeds are not as good as those recorded at SP speeds.

**Other VCR Notes:**

To check your programmed settings press the Prog. Check button on the remote control. See page 28 for more details.

For troubleshooting on timer Recording see page 23.

**RECORDING SPEED**

Select the speed at which you would like to record SP (standard play) or EP (extended play)

- Press any MENU button to display the VCR menu screen.  
 ▲▼ To RECORDING SPEED  
 ▲▼ To set to SP or EP  
 Press EXIT to finish

**AUTO SP→EP**

This function is used with timer-recording (pg 20 or pg 22) while in the SP tape speed mode. The unit automatically calculates the amount of time left in the recording and the amount of tape left on the cassette. If there is not enough tape to finish the recording, the unit automatically switches to the EP mode to finish the recording.

- Press any MENU button to display the VCR menu screen.  
 ▲▼ To AUTO SP→EP  
 ▲▼ To set to ON or OFF

**ON:** The unit will automatically switch from SP to EP speed if there is not enough tape left on the cassette to finish the recording.

**OFF:** The tape speed will not change. The tape may run out before recording is finished.

- Press EXIT to finish

**REPEAT PLAY**

Once playback of a cassette has finished, this function automatically rewinds the tape and begins playback again. Playback may be repeated up to 50 times.

- Press any MENU button to display VCR Menu screen  
 ▲▼ To REPEAT PLAY  
 ▲▼ To turn Repeat play ON or OFF  
**ON:** Once a tape has finished it will automatically rewind and replay  
**OFF:** Tape will stop when playback is completed.

- Press EXIT to finish.

**Note:** If a non-recorded period of three seconds or more is encountered on a tape, playback will stop and the tape will automatically rewind. If you timer-record two programs back-to-back, a non-recorded period will automatically be inserted between programs.

**V. STABILIZER**

This function eliminates any vertical shaking of the video image during playback in EP mode.

- Press any MENU button to display the VCR menu screen.  
 ▲▼ To V. STABILIZER  
 ▲▼ To turn ON or OFF  
 Press EXIT to finish

**Notes:** Closed Captioning may not display properly when V. Stabilizer is set to "ON".  
 After a power interruption or once a tape is ejected, V. Stabilizer will return to "OFF".

**VCR PLUS+**

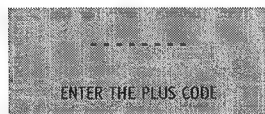
Your TV/VCR Combo comes equipped with VCR Plus+ technology. This function allows you to program your VCR simply by entering the VCR Plus+ code number associated with the program you wish to record.

**Note:** Before VCR Plus+ can be used, VCR Plus guide channels must be programmed. See VCR Plus Guide Setup in "Initial Setup" page 14, if you have not yet programmed these channels).

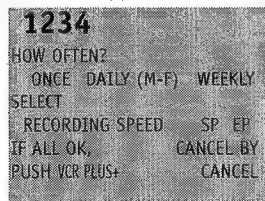
**TIMER RECORDING WITH VCR PLUS+**

 Press the VCR PLUS+ button on the remote control

The VCR PLUS+ code screen appears



Enter the VCR PLUS+ code (three-to-eight digit number) of the show you wish to record using the 10-key pad on the remote control. The following screen will appear:



**Note:** If you enter the VCR Plus+ code incorrectly, press CANCEL on the remote. The first screen will reappear.



Press the DAILY/WEEKLY button to select how often a program should be recorded, ONCE, DAILY, or WEEKLY

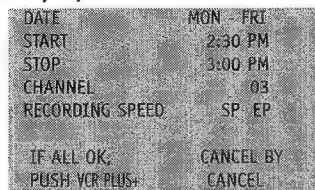


Press the SP/EP button to select SP or EP recording speed. (See pg 20 for more on tape recording speeds)



Press the VCR PLUS+ button

The following screen will appear, displaying a summary of the information you just entered:



If the settings are correct, press the VCR Plus+ button again to accept. The following message will appear:



If you wish to make a correction, use the (▲▼) buttons to move to the item and the (◀▶) buttons to correct. Once corrected press VCR Plus+ to accept the settings.



Press the Timer button on the remote control. The timer is now in standby mode.

The REC lamp will glow green on the front panel of the unit, indicating the timer has been programmed. When the programmed start time arrives, the REC lamp will glow red and recording will begin. When the programmed stop time arrives, the lamp will go out and the recording will automatically stop. If there are other pre-set recordings the REC lamp will glow green.

**NOTES:****VCR Plus+ Codes**

VCR Plus+ codes for individual programs may be found in most local newspaper television listings or in TV magazines. VCR Plus+ Codes are the three to eight digit number usually shown after the title or description of a program in TV listings.

You can program your VCR with up to six events. These events may be up to a month in the future. For more information on setting timer recordings, see "Regular VCR Programming" on page 20.

**Note:**

VCR Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

**TIMER RECORDING TROUBLESHOOTING**

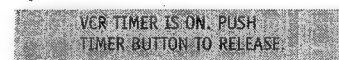
The following are some common problems/issues that may arise while using Timer Recording.

**REC lamp starts flashing when you press TIMER on the remote control.**

No cassette is loaded into VCR. Insert a cassette into VCR and continue.

Cassette loaded has its recording tab removed.

Insert a recordable cassette, or cover the missing tab hole with two layers of tape.

**The following message appears when attempting to eject tape or operate VCR:**

Press the TIMER button and set Timer Mode to Off. Try operating VCR again.

**To stop taping once automatic recording has begun.**

Press the TIMER button, then the Stop button.

**INSTANT TIMER RECORDING (ITR)**

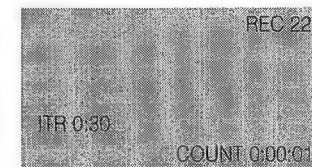
Instant Timer Recording allows you to set the VCR timer after the videotaping of a program has begun. The ITR timer can be programmed to stop recording up to four hours after it has begun.

To use the ITR timer, the VCR must already be recording. Press the Rec/ITR button on the front panel of the VCR (Note: This function cannot be accessed with the remote control)



Rec/ITR

The following display will appear on the screen:



The timer above is set to stop recording in 30 minutes.

Press the ITR button again to increase the amount of time on the ITR timer. Each press increases the amount by 30 minutes. The ITR timer can be set from a minimum of thirty minutes "ITR 0:30" to a maximum of four hours "ITR 4:00" When the time allotted to the ITR expires, the recording automatically shuts off.

**Note:** To cancel the ITR timer, press the Rec/ITR button until the on-screen display disappears.

**Note:** To stop recording before the allotted time expires, press the Stop button.

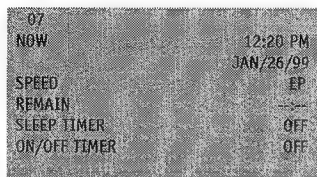


## BUTTON FUNCTIONS

This section will describe in detail the different buttons on your remote control and their functions. Buttons related to the operation of the television are listed first, followed by the buttons used to operate the VCR. The names of individual buttons in this section are printed in SMALL CAPS.

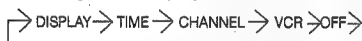
### DISPLAY

The Display screen shows the current status of timers and inputs.



- The channel or AV input (Channel 07)
- Current time (12:20 PM)
- Current date (Jan. 26, 1999)
- Recording Speed (EP)
- Amount of tape remaining on video cassette. (---:--)
- Sleep Timer status/minutes remaining (OFF)
- On/Off Timer status (OFF)

Each press of the DISPLAY button changes the display mode:



Display shows the above menu screen. Time shows only the current time over the television picture. Channel shows only the number of the channel the television is currently tuned to. VCR shows the VCR's current function (for example - "Play") and tape counter.

**Note:** VCR display is only available when there is a tape in the unit.

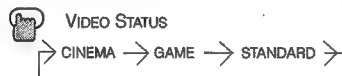
## VIDEO STATUS

The VIDEO STATUS button gives your television a movie theater-like quality with the "Cinema" setting, raises the level of video game detail with "Game" setting, or resets display to factory settings with "Standard".

"Standard" resets the picture settings to factory-set levels.

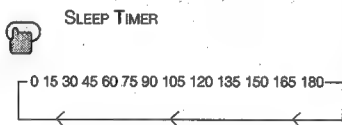
"Cinema" Gives a film-like look to television and video programs

"Game" enhances the appearance of video game graphics.



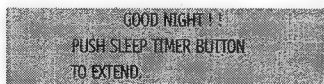
## SLEEP TIMER

Sleep Timer turns off the TV for you in case you fall asleep. Program it to work in intervals of 15 minutes up to 180 minutes.



### SLEEP TIMER MESSAGE

20 seconds prior to the automatic shut-off, this message will appear:



You then have 20 seconds to press the SLEEP TIMER button to delay turn off for another 15 minutes.

### NOTES:

Please note that if the clock, Sleep Timer, or On/Off Timer are not set, the initial Display screen will state "Clock Not Set," "Sleep Timer Off," and "On/Off Timer Off," respectively.

### Notes on Display:

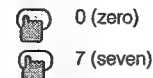
"Remain" automatically calculates how much time is remaining on a video cassette inserted in the unit. If the display reads "---:--", run the tape a little bit, then try Display again. If there is no tape inside the unit, Remain will read "00:00".

## NUMBER BUTTONS

### 10 KEY PAD

Press two of the number buttons to move to single and double digit channels.

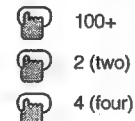
To move to Channel 7:



### 100 +

The 100+ button accesses all channels above Channel 99.

To move to Channel 124:



## MUTING

The Muting button turns the sound off completely when you press it.



The sound will turn off completely.

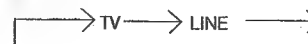
**Note:** To return to the original volume press Muting again.

## MENU BUTTONS (▲▼◀▶)

Press any of the four menu buttons to access the onscreen menu system.

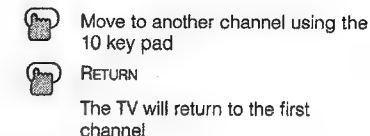
## INPUT

INPUT selects the input mode.



## RETURN

Return to the last channel viewed after moving to another channel via the 10 key pad.

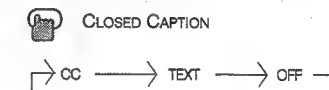


## EXIT

The Exit button lets you leave any menu and return to normal television viewing.

## CLOSED CAPTION

View the closed captions or text when included in a broadcast.



**Note:** For more information on Closed Caption, see page 18.

**Note:** Closed captioning is not available on video cassettes.

## CHANNEL +/-

The CHANNEL +/- button lets scan forward and backwards through the available television channels. For more on this feature, see page 9.

## VOLUME +/-

The VOLUME +/- button raises or lowers the volume. For more on this feature, see page 9.

## TV/CATV SWITCH

For normal operation of your TV/VCR combo, set the TV/VCR switch to "TV". If you use a cable box to select channels, set the switch to "CATV".

**Note:** The VCR buttons will only work when the remote is set to "TV". If you use the "CATV" setting, you must switch to "TV" when you wish to operate the VCR.



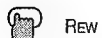
## VCR FUNCTIONS - BASIC

The following buttons control the basic functions of the VCR.



PLAY

- Begins playback of a video cassette.



REW

- Rewinds tape. If pressed when tape is stopped, the tape counter will be displayed on screen. Can also be used with PLAY to scan backwards through tape.



FF

- Fast Forward. If pressed when tape is stopped, the tape counter will be displayed on screen. Can also be used with PLAY to scan forward through tape at an accelerated rate.



PAUSE

- Freezes a single frame of video on screen during playback. Press PLAY to resume normal playback.
- While tape is paused, you can advance forward frame-by-frame. Each press of the PAUSE button will move the tape ahead one frame.
- While tape is playing back, you can slow the speed to 1/6 of normal by pressing and holding PAUSE for two seconds.



REC

- Immediately begins recording of program currently on television. To start recording, press PLAY while holding down REC button.



STOP

- Halts VCR function. Will stop tape during play, record, fast-forward, or rewind functions. If pressed while REW or FF is being used with PLAY, tape will return to normal playback.

## INDEX SEARCH

Most JVC-brand VCR's automatically insert an index mark at the start of a recording. The INDEX SEARCH +/- buttons can be used to scan a cassette for these marks, to quickly find the beginning of a taped program.



INDEX SEARCH +

Scans tape forward for index marks. If there are numerous programs recorded on one tape, you can press the INDEX SEARCH button a number of times to search for that number of marks. (For example four presses will move ahead four index marks). A recording up to nine index marks ahead may be accessed.



INDEX SEARCH -

Scans tape backward for index marks. If there are numerous programs recorded on one tape, you can press the INDEX SEARCH button a number of times to search for that number of marks. (For example four presses will move back four index marks). A recording up to nine index marks behind may be accessed.

## TRACKING ADJUSTMENT

During playback, if tracking (the alignment of the video heads on the video cassette tape) deviates, an unclear picture is displayed. This TV/VCR Combo is equipped with an automatic tracking function. There are cases when manual tracking adjustment is needed. They include:

- When the auto tracking does not work properly and the picture remains unclear.
- If the picture moves vertically during playback

Open the cover of the TV/VCR combo front panel.



Press the CHANNEL + and CHANNEL - on the front panel simultaneously during playback.

**Note:** No special tracking indication will appear on screen.



Press either the CHANNEL + or CHANNEL - buttons to reduce the disturbance or vertical vibration of the picture.

**Note:** Once video cassette is removed, manual tracking will automatically be turned off.

### NOTES:

Index marks are a function of JVC-made video decks. Therefore, INDEX SEARCH cannot be used on commercially produced tapes, or tapes recorded on non-JVC brand VCR's, since these tapes will not have the JVC index marks recorded on them.

If you try to begin an index search at a point on the tape between two programs, INDEX SEARCH may not work correctly. Either fast-forward, or rewind the tape a bit and try INDEX SEARCH again.

## SKIP SEARCH

Each time you press the SKIP SEARCH button while a tape is playing, the unit will fast-forward ahead 30 seconds on the tape. You may press the button up to four times in a row to move 120 seconds or two minutes ahead.



SKIP SEARCH

## RE-VIEW

Once a timer-recording has finished, pressing the Re-View button automatically rewinds the tape to the start of the newly recorded program.



RE-VIEW

**Note:** No other VCR functions can be used before pressing Re-View. Using any other functions will prevent Re-View from working.

## EJECT

The video cassette is automatically rewound and then ejected with one push of the EJECT button.



EJECT

## DISPLAY

By pressing DISPLAY while a video cassette is playing you can check on how much tape remains or tape speed. Display also shows the tape counter on-screen. Refer to page 24 for more details.



DISPLAY

## CANCEL

Use to cancel a pre-set timed program or if you input a VCR Plus+ code incorrectly on the VCR Plus+ screen.



CANCEL

## SP/EP

Selects a recording speed (SP or EP) for simple recording. See "Regular VCR Programming" on page 20 for more details.



SP/EP

## SHUTTLE PLUS +/-

Lets you gradually increase or decrease the playback speed of a video cassette. With a videotape playing choose either the SHUTTLE PLUS + or SHUTTLE PLUS - button.



SHUTTLE PLUS +

Each time this button is pushed, playback speed will increase. Button can be pushed a maximum of seven times.



SHUTTLE PLUS -

Each time this button is pushed, playback speed will decrease. Button can be pushed a maximum of seven times.

To resume playback at normal speed, press the PLAY button.

## TIMER

Lets you turn the Timer Mode ON and OFF.



TIMER

## VCR PLUS+

Accesses the TV/VCR Combo's VCR Plus+ functions. For more information on timer recording with VCR Plus+, see page 22.



VCR PLUS+

## DAILY/WEEKLY

Selects how often a program will be recorded: Once, Daily, or Weekly. Pressing Daily/Weekly will access this option in the Timer Recording menu.



DAILY/WEEKLY



## PROGRAM CHECK

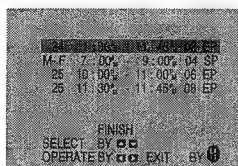
The **PROGRAM CHECK** button allows you to confirm the programmed settings of your VCR. You can also make changes if you find any errors.

### Confirm Timer Settings.

Press the Program Check button to display the timer information



PROG. CHECK

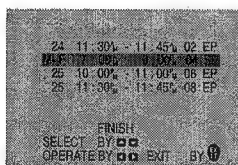


□ Press again to leave screen.

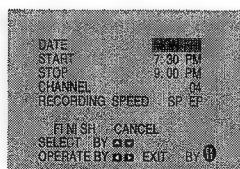
### Changing Timer Settings

If you find an error, you may correct it from the program check screen.

▲▼ To program you wish to change



◀▶ To display "REGULAR VCR PROGRAMMING" screen.



## Program Check Continued

Use the Menu buttons to select which items you wish to change. (For more on Regular VCR Programming, see page 20).

### Cancelling Timer Programs

Press the Program Check button to display the timer information

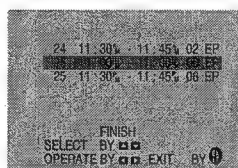


PROG. CHECK

Select the program you wish to cancel



CANCEL



Press PROG. CHECK again to exit.

## REC/ITR

(On TV/VCR Combo unit front panel)

REC/ITR

Pressing the **Rec/ITR** button once will begin videotape recording on on-screen program. Pressing button a second time will activate **ITR** (Instant Timer Recording) timer. See "Instant Timer Recording" on page 23 for more information.

## STOP/EJECT

(On TV/VCR Combo unit front panel)

STOP/EJECT

Pressing the **Stop/Eject** button once will halt any on-going VCR function such as playback, record, rewind, etc. Press the button while the VCR is stopped to eject video cassettes.

PROBLEMS	CHECK
There is no power	<ul style="list-style-type: none"> <li>• See if the power cord became unplugged.</li> <li>• Perhaps you have experienced a blown circuit breaker or fuse or a power outage.</li> </ul>
There is no picture or no sound	<ul style="list-style-type: none"> <li>• The antenna could be disconnected.</li> <li>• The input mode (TV or Video) could not be set properly, refer to page 25.</li> <li>• The tuner mode (in the Auto Tuner Setup) could be set improperly, refer to page 12.</li> <li>• The station may be having difficulties, check to see if other channels are operating normally.</li> </ul>
Remote control is not operating or operating properly	<ul style="list-style-type: none"> <li>• Check that the batteries are still working and properly installed.</li> <li>• Make sure there are no objects blocking a clear path from the remote to the TV.</li> <li>• Check that the TV/CATV switch is in the proper position — set to TV to view television.</li> </ul>
You cannot select a certain channel	<ul style="list-style-type: none"> <li>• Maybe you are too far from the TV, you must be within 23 feet (or 7 meters).</li> <li>• Make sure the channels are programmed. See Channel Summary, page 12.</li> <li>• Perhaps the channel is locked, select it with the 10 key pad and follow instructions on page 13.</li> </ul>
The power turns off by itself	<ul style="list-style-type: none"> <li>• Perhaps the On/Off Timer is set, press the power button, check page 18.</li> <li>• The power was interrupted or the power cord unplugged. Reset the clock, check page 17.</li> <li>• The Sleep Timer may be set, check page 24</li> </ul>
The clock is wrong	<ul style="list-style-type: none"> <li>• The power was interrupted and the clock not reset. Reset the clock, check page 17.</li> </ul>
On Timer is blinking	<ul style="list-style-type: none"> <li>• There is a problem with the TV. Unplug the set and call for service.</li> </ul>
PICTURE	CHECK
The picture color quality is poor	<ul style="list-style-type: none"> <li>• Tint and color may be improperly adjusted. Check page 15.</li> <li>• Video Status mode may be set to an inappropriate setting. Check page 24.</li> </ul>
There are lines across the picture	<ul style="list-style-type: none"> <li>• There could be interference from another energy consuming appliance, such as a computer, another TV or VCR. Move any other such appliances farther away from the TV.</li> </ul>
The picture is spotted	<ul style="list-style-type: none"> <li>• There could be interference from a running high wattage appliance such as a hair-dryer, vacuum cleaner, or neon sign. You will have to move the antenna away from the source of the interference or change it to a coaxial cable which is less prone to interference.</li> </ul>
Double picture (Ghosts)	<ul style="list-style-type: none"> <li>• A building or airplane can reflect the original signal producing a second, delayed one. Adjust the antenna position.</li> </ul>
Snowy picture/ Image noise	<ul style="list-style-type: none"> <li>• The antenna may be damaged, disconnected or turned. Check the antenna connection, page 6, and your Quick Setup Guide. If it is damaged, you will have to replace it.</li> </ul>
Screen is 80% black	<ul style="list-style-type: none"> <li>• Closed Caption Text Mode is on. Turn it off in the Closed Caption Menu (page 18).</li> </ul>
SOUND	CHECK
Bilingual or stereo programs can't be heard	<ul style="list-style-type: none"> <li>• Make sure the MTS mode is properly set. Refer to page 16 for details on setting MTS Modes.</li> </ul>
There is no sound from the TV speakers.	<ul style="list-style-type: none"> <li>• The volume is set to "0". Adjust it by pressing the VOLUME + button.</li> <li>• Has the Muting button been pressed? If so, press Muting again to return volume to normal.</li> <li>• Is an earphone/headphone attached to the jack at the front of the TV? If the phones jack is in use, the TV's speakers will not produce sound.</li> </ul>
NOT A PROBLEM	DON'T WORRY ABOUT THIS, IT'S NORMAL
Static electricity	<ul style="list-style-type: none"> <li>• It is normal to feel a surge of static electricity if you brush over or touch the screen.</li> </ul>
You hear occasional crackling sounds	<ul style="list-style-type: none"> <li>• It is normal for the TV to emit crackling sounds when turned on or off. Unless the sound or picture become abnormal, this is fine.</li> </ul>





PROBLEMS	CHECK
The video cassette will not enter the VCR	<ul style="list-style-type: none"> <li>• Make sure you are attempting to insert the tape properly. The clear window on the cassette should be facing up and the label on the narrow part of the cassette should face away from the machine.</li> <li>• Are you attempting to use a cassette that is not a VHS or S-VHS type? Only these types of cassettes may be used in this machine.</li> </ul>
The cassette will not eject	<ul style="list-style-type: none"> <li>• Is the VCR set for timer-recording? A cassette cannot be removed while the timer is running. To eject the tape while the timer is operating, press the <b>TIMER</b> button on the remote control to shut it off. You may then press <b>EJECT</b> on the front panel of the unit to remove the tape.</li> </ul>
Dual or stereo sound cannot be heard	<ul style="list-style-type: none"> <li>• This VCR allows for recording and playback in mono sound only.</li> </ul>
Two sounds are heard at the same time during playback	<ul style="list-style-type: none"> <li>• When a tape with stereo Hi-Fi recorded as its normal track is played back, two separate soundtracks may be heard at the same time. Make sure when renting or purchasing recorded video tapes that they are compatible with monaural sound mode.</li> </ul>
Unit makes mechanical-type sounds when no operation is being performed	<ul style="list-style-type: none"> <li>• Is the VCR set to begin timer-recording? When a timer-recording starts, it is normal to hear the cassette tape being engaged inside the machine. This is not a malfunction.</li> <li>• Have you just finished watching a tape? Two or three minutes after you finish watching a tape, the VCR heads automatically disengage from the tape to protect the tape. Sound is also heard at this time. This is not a malfunction either.</li> </ul>
The cassette gets stuck halfway during loading or unloading	<ul style="list-style-type: none"> <li>• Try unplugging the unit from the power outlet, then plugging back in. If this does not work, call your local dealer for service.</li> </ul>
The VCR started rewinding the tape automatically	<ul style="list-style-type: none"> <li>• During recording, playback, or fast-forwarding when the unit reaches the end of the tape, it starts rewinding automatically.</li> <li>• Is the VCR set to Repeat Play? See "Repeat Play", page 21.</li> </ul>
Recording won't start	<ul style="list-style-type: none"> <li>• Has the safety tab at the rear of the cassette been removed? A cassette cannot be used for recording without this tab. If the tab is missing and you still want to record on that tape, cover the hole with two layers of adhesive tape.</li> </ul>
"Noise" (static) appears on the picture during playback	<ul style="list-style-type: none"> <li>• The VCR heads may be dirty. Use a commercially available cleaning cassette to clean the heads.</li> </ul>
Still (paused) picture vibrates up and down	<ul style="list-style-type: none"> <li>• Manually adjust the VCR's tracking. See "Tracking Adjustment", page 26.</li> </ul>
VCR cannot be set for timer-recording	<ul style="list-style-type: none"> <li>• Are you trying to timer-record more than six programs? The maximum number of timer-recordings that can be set at one time is six.</li> <li>• Do timer-recordings overlap? You can check timer settings by pressing <b>Prog. CHECK</b> on the remote control. For <b>Prog. CHECK</b>, see page 28. For timer recording overlap, see page 20.</li> </ul>
The VCR cannot be operated	<ul style="list-style-type: none"> <li>• Is there a video cassette inserted in the unit? If there is no cassette inserted, the VCR cannot be operated.</li> </ul>
Timer-recording is set but VCR cannot timer record.	<ul style="list-style-type: none"> <li>• Do timer-recording overlap? See the "Notes on overlapping programs" on page 20.</li> </ul>

For Canadian model televisions, see separate sheets for Warranty/Garantie and JVC Authorized Service Centers in Canada.

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period shown below (the "Warranty Period") (PICTURE TUBE is covered for Two (2) years.)

Parts	Labor
1 YEAR	90 DAYS

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND COMMONWEALTH OF PUERTO RICO.

#### WHAT WE WILL DO:

If this product is found to be defective within the warranty period, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during regular business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of this Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis. Televisions with a screen size of 25 inches and larger may be covered on an in-home basis where such service is available.

#### WHAT YOU MUST DO FOR WARRANTY SERVICE:

To determine if in-home service is available in your area, either contact the selling dealer (retailer) or call 1-800-537-5722 to locate the nearest JVC authorized service center. Service locations can also be obtained from our website <http://www.jvc-service.com>. In-home service, if available, will require clear access to the television by the service representatives. If in-home service is not available, carry in service will be provided.

If service is not locally available, box the product carefully, preferably in its original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location which will be given to you by the toll free number.

If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

#### WHAT IS NOT COVERED:

This limited warranty provided by JVC does not cover:

- 1) Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
- 2) Initial installation, installation and removal from "built-in" entertainment centers and other mounting systems;
- 3) Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
- 4) Damage that occurs in shipment, due to an act of God, and cosmetic damage;
- 5) Signal reception problems and failures due to line power surge;
- 6) Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus (Needle) are covered for 90 days from the date of purchase;
- 7) Accessories;
- 8) Batteries (except that Rechargeable Batteries are covered for 90 days from date of purchase.)

There are no express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential damages or limitations on how long the warranty lasts, so these exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary state to state.

JVC COMPANY OF AMERICA  
DIVISION OF JVC AMERICAS CORP.  
<http://www.jvc-service.com>

1700 Valley Road  
Wayne, New Jersey 07470

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY. THIS WARRANTY DOES NOT APPLY FOR DETAILS OF REFURBISHED PRODUCT WARRANTY. PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

#### For customer use:

Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model No.: \_\_\_\_\_ Serial No.: \_\_\_\_\_  
Purchase Date: \_\_\_\_\_ Name Of Dealer: \_\_\_\_\_

**AUTHORIZED SERVICE CENTERS**

QUALITY **JVC** SERVICE

HOW TO LOCATE YOUR JVC SERVICE CENTER

**TOLL FREE: 1 (800) 537-5722**

**<http://www.jvcservice.com>**

*Dear Customer;*

*In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, call 1-800-537-5722 for your authorized servicer. Remember to retain your Bill of Sale for Warranty Service.*

— JVC

**JVC SERVICE & ENGINEERING  
COMPANY OF AMERICA**  
DIVISION OF JVC AMERICAS CORP.

**FACTORY SERVICE CENTER LOCATIONS**

Dear customer;

In order to receive the most satisfaction from your purchase, read this guide before operating the unit, and before calling for service make sure you check the Troubleshooting pages at the end of this book. In the event that repair is necessary, or for the address nearest you, please refer to the factory service center list below, or within the continental United States, call the toll free number above for an authorized service center. Remember to retain your bill of sale for warranty service.

107 Little Falls Road  
Fairfield, NJ 07004-2105  
(973) 808-9279

1500 Lakes Parkway  
Lawrenceville, GA 30243-5857  
(404) 339-2522

705 Enterprise Street  
Aurora, IL 60504-8149  
(630) 851-7855

5665 Corporate Avenue  
Cypress, CA 90630-0024  
(714) 229-8011

2969 Mapunapuna Place  
Honolulu, HA 96819-2040  
(808) 833-5828

10700 Hammerly Suite 110  
Houston, TX 77043  
(713) 935-9331

13 Cummings Park  
Woburn, MA 01801  
(781) 376-9100

8192 State Road 84  
Davie, FL 33324  
(954) 472-1960

890 Dubuque Avenue  
South San Francisco, CA 94080-1804  
(650) 871-2666

*Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is key to maintaining the high level of performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.*

NATIONAL HEADQUARTERS  
JVC SERVICE & ENGINEERING COMPANY OF AMERICA  
DIVISION OF JVC AMERICAS CORP.  
1700 Valley Road  
Wayne, New Jersey 07470

**IF YOU SHIP THE PRODUCT**

*Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.*

**Don't service it yourself.**

**CAUTION**

*To prevent electrical shock, do not open the cabinet. No user serviceable parts inside. Refer to qualified service personnel.*

**ACCESSORIES**

*To purchase accessories for your JVC product, you may contact your local JVC Dealer. Or from the 48 Continental United States call toll free : 1 (800) 882-2345*

# SPECIFICATIONS

MODEL	TV-20240
Type	TV/VCR Combo
Reception Format	NTSC, BTSC System (Multi Channel Sound)
Reception Range	VHF 2 to 13. UHF 14 to 69 Sub Mid, Super, Hyper, and Ultra bands (181 channel frequency synthesizer system)
Power Supply	120VAC, 60 Hz
Power consumption	100W / 1.5A
Screen Size	20 Inches / 50.8 cm measured diagonally full square
Audio Output	1.2W x 1.2W
Speakers	1-4/5" x 4" / 4.5 x 10 cm oval x 2
Antenna Terminal	75 ohms (VHF/UHF) terminal (F-type connector)
External input jacks	Video: 1 Vp-p., 75 ohms Audio: 500mVrms (-4dBs audio) high impedance
Phones jack	3.5 mm stereo mini-jack
Recording/Playback system	VHS system (SQPB) 4 head helical scan system
Video Signal	NTSC system
Recording system	VHS monaural system Monaural-linear track system
Tape Speed	EP / SP
Program capacity	1- month programmable timer / 6 programs
Memory backup time	Approximately 90 seconds
Clock Reference	AC
External Dimensions (W x H x D)	22 5/8" x 19 7/8" x 19 1/8" / 57.2 x 50.3 x 48.3 (cm)
Weight (lbs./kg.)	52.4 (lbs.) / 23.8 (kg.)
Accessories	1 Remote control unit, 2 AA batteries

Specifications subject to change without notice.

**JVC COMPANY OF AMERICA**  
DIVISION OF JVC AMERICAS CORP.  
1700 Valley Road  
Wayne, New Jersey 07470

**JVC**

**JVC CANADA, INC.**  
21 Finchdene Square  
Scarborough, Ontario  
Canada M1X 1A7



LCT0316-001A-H  
0299-TN-JII-JMT

# SAFETY PRECAUTIONS

1. The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by ( $\Delta$ ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
4. **Use isolation transformer when hot chassis.**  
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
5. **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**  
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : ( $\perp$ ) side GND, the ISOLATED (NEUTRAL) : ( $\downarrow$ ) side GND and EARTH : ( $\oplus$ ) side GND. Don't short between the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and ISOLATED (NEUTRAL) side GND or EARTH side GND at the same time.  
If above note will not be kept, a fuse or any parts will be broken.
6. If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
7. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
8. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k $\Omega$  2W resistor to the anode button.
9. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

## 10. Isolation Check

### (Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

### (1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.

(... Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

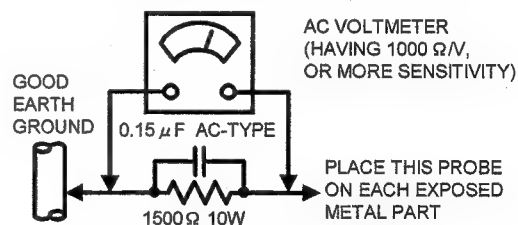
### (2) Leakage Current Check

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

#### • Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500 $\Omega$  10W resistor paralleled by a 0.15 $\mu$ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.). However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



## 11. High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.

See item "How to check the high voltage hold down circuit".

This mark shows a fast operating fuse, the letters indicated below show the rating.



# FEATURES

- New chassis design enables use of a single board with simplified circuitry.
- Provided with miniature tuner (TV/CATV).
- Multifunctional remote control permits picture adjustment.
- I<sup>2</sup>C bus control utilizes single chip ICs.
- Adoption of the VIDEO STATUS function.
- Adoption of the ON/OFF TIMER function.
- With 75ΩV/U in common (F-Type) ANT Terminal.
- SLEEP TIMER for setting in real time.
- Closed-caption broadcasts can be viewed.
- Audio Video input terminal.

## DIFFERENCE LIST OF MAIN PARTS

△	Model Name	TV-20240(US)	TV-20240(CA)
	Parts Name		
△	RATING LABEL	CM22907-002-H	CM22874-001-H
	FCC LABEL	LC40401-001A	×
△	INST BOOK	LCT0316-001A-H	LCT0316-001A-H LCT0317-001A-H
	REGISTRATION C	BT-51020-1H	×
	SVC CENTER LIST	×	BT-20071B-H
	WARRANTY CARD	×	BT-52002-1H



## REPLACEMENT OF CHIP COMPONENT

### ■ CAUTIONS

1. Avoid heating for more than 3 seconds.
2. Do not rub the electrodes and the resist parts of the pattern.
3. When removing a chip part, melt the solder adequately.
4. Do not reuse a chip part after removing it.

### ■ SOLDERING IRON

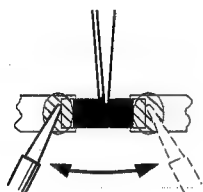
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

### ■ REPLACEMENT STEPS

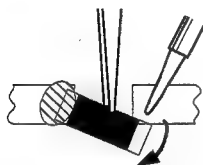
#### 1. How to remove Chip parts

##### ◆ Resistors, capacitors, etc.

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.



- (2) Shift with tweezers and remove the chip part.



##### ◆ Transistors, diodes, variable resistors, etc.

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

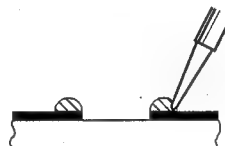


Note : After removing the part, remove remaining solder from the pattern.

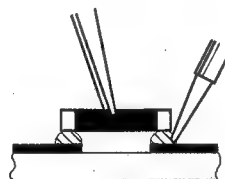
#### 2. How to install Chip parts

##### ◆ Resistors, capacitors, etc.

- (1) Apply solder to the pattern as indicated in the figure.

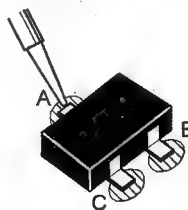


- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

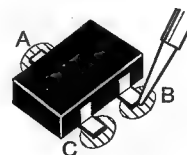


##### ◆ Transistors, diodes, variable resistors, etc.

- (1) Apply solder to the pattern as indicated in the figure.
- (2) Grasp the chip part with tweezers and place it on the solder.
- (3) First solder lead A as indicated in the figure.



- (4) Then solder leads B and C.



# SPECIFIC SERVICE INSTRUCTIONS(TV)

## DISASSEMBLY PROCEDURE

### REMOVING THE REAR COVER

1. Unplug the power supply cord.
2. Remove the 8 screws marked (A) and 1 screws marked (B) as shown in Fig.1.
3. After removing the screw marked (C), push the hook of the back cover and remove the back cover. Pull out the power cord clamp horizontally.
4. Remove the REAR COVER toward you.

### REMOVING THE CHASSIS

- After removing the rear cover.
1. Slightly raise the both sides of the chassis by hand and remove the 2 claws under the both sides of the chassis from the front cabinet.
  2. Draw the chassis back ward.

※ When the locking hooks on both sides of the main chassis are removed, the MAIN PW Board of the TV section can be raised upright.

### REMOVING THE SPEAKER

- After removing the rear cover.
1. Remove the 4 screws marked (D) as shown in Fig.1.
  2. Follow the same steps when removing the other hand speaker.

### REMOVING THE SHIELD CASE.

- After removing the rear and chassis.
1. Remove the 6 screws marked (E), and the 2 screws (F) marked (Fig.1)
  2. You can lift the SHIELD CASE.

### CHECKING THE MAIN PW BOARD OF VIDEO SECTION

- After removing the SHIELD CASE.
1. Removing the 4 screws marked (G) (Fig.2)
  2. The 2 screws (marked (G)) at the front side are located under the housing. Accordingly, remove then after shifting the housing backward, Turning the pulley in the arrow direction can shift the housing.
  3. Removing the 2 screws marked (H) and removing the FRONT BRACKET.
  4. Removing the 2 screws marked (I) and removing the VTR BRACKET.
  5. When the locking hooks on both sides of the chassis are removed, the MAIN PW Board of the VTR can be raised upright.
- For details, please refer to the SPECIFIC SERVICE INSTRUCTIONS (VCR).

### Caution

This model cannot be serviced with the TV and video sections separated. Perform video section service as a set with the TV section.

### IMPORTANT

- Do not leave the TV set unattended with the video section removed. There is danger of a user inserting a cassette into vacant slot and touching live parts.
- When the main chassis is inserted again after inspections and adjustments open the front cassette door at a 45 degree angle and carry out the insertion work. If the main chassis is inserted without opening the cassette door, the door may not open afterward.

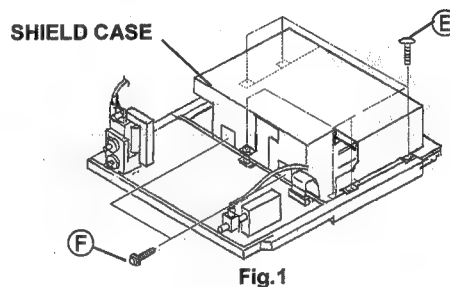


Fig.1

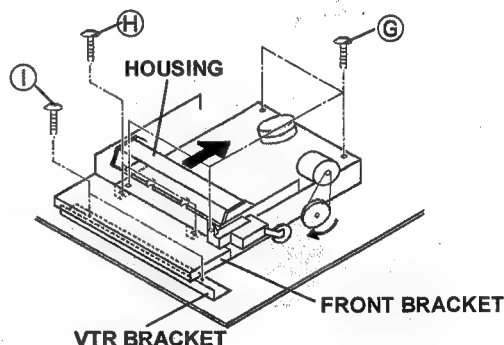
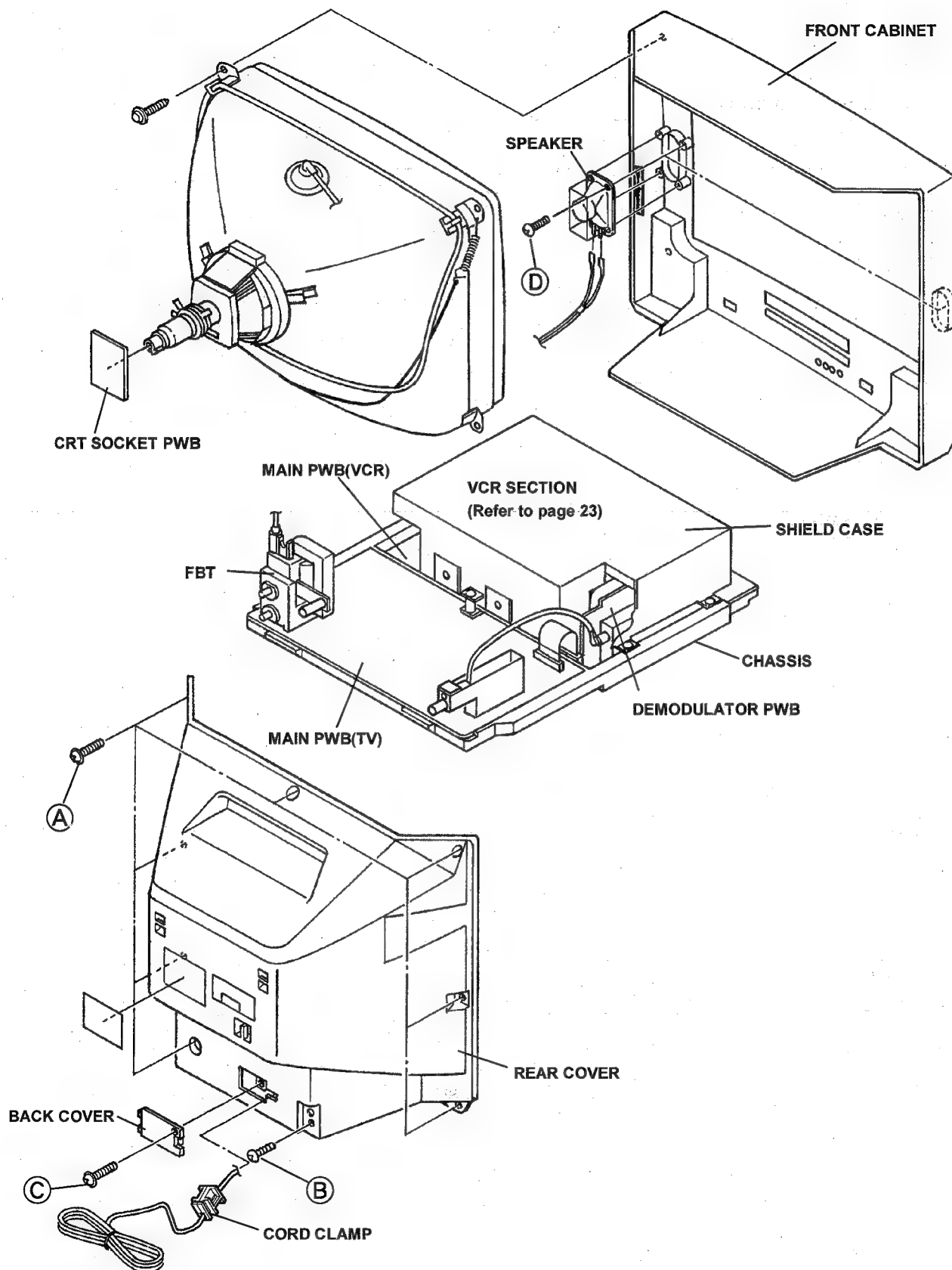


Fig.2



## MEMORY IC REPLACEMENT

### 1. Memory IC

This model use a memory IC.

This memory IC stores data for proper operation of the video and deflection circuits.

When replacing, be sure to use an IC containing this (initial value) data.

### 2. Memory IC replacement procedure

Procedure	Procedure
<b>(1) Power off</b> Switch off the power and disconnect the power cord from the outlet.	<b>(4) Receive channel setting</b> Refer to the OPERATING INSTRUCTIONS (USER'S GUIDE) and set the receive channels (Channels Preset) as described.
<b>(2) Replace the memory IC</b> Initial value must be entered into the new IC.	<b>(5) User settings</b> Check the user setting items according to Table 1. Where these do not agree, refer to the OPERATING INSTRUCTIONS (USER'S GUIDE) and set the items as described.
<b>(3) Power on</b> Connect the power cord to the outlet and switch on the power.	<b>(6) SERVICE MENU setting</b> Verify what to set in the SERVICE MENU, and set whatever is necessary. Refer to the SERVICE ADJUSTMENT for setting.

**TABLE 1 (User setting value)**

Setting item	Setting value	Setting item	Setting value
<b>1. Use remote controller keys</b>			
POWER	OFF	DISPLAY	OFF
CHANNEL	CH 02	CAPTION	OFF
VOLUME	10	VIDEO STATUS	STANDARD
INPUT	TV	TIMER	OFF
<b>2. Setting of MENU</b>			
<b>INITIAL SETUP ITEMS</b>		<b>SOUND SETTINGS</b>	
AUTO TUNER SETUP	AIR	BASS	CENTER
SET VCRPLUS+GUIDE CHANNEL	GUIDE CH=TV CH	TREBLE	CENTER
CHANNEL SUMMARY	SET OPTIONALLY	BALANCE	CENTER
SET LOCK CODE	Unnecessary to set	MTS	STEREO
<b>VCR SETUP SETTINGS</b>		<b>TIMER SETUP ITEMS</b>	
REGULAR VCR PROGRAMMING	Unnecessary to set	SET CLOCK	Unnecessary to set
RECORDING SPEED	SP	ON/OFF TIMER	NO
AUTO SP → EP	OFF	<b>GENERAL ITEMS</b>	
REPEAT PLAY	OFF	LANGUAGE	ENG
V STABILIZER	OFF	CLOSED CAPTION	CAPTION : CC1, TEXT : T1
<b>PICTURE SETTINGS</b>		NOISE MUTING	ON
TINT	CENTER		
COLOR	CENTER		
PICTURE	CENTER		
BRIGHT	CENTER		
DETAIL	CENTER		

# SERVICE ADJUSTMENTS(TV)

## ADJUSTMENT PREPARATION:

1. You can make the necessary adjustments for this unit with either the Remote Control Unit or With the adjustment tools and parts as given below.
2. Adjustment with the Remote Control Unit is made on the basis of the initial setting values, however, the new setting values which set the screen to its optimum condition may differ from the initial settings.
3. Make sure that AC power is turned on correctly.
4. Turn on the power for set and test equipment before use, and start the adjustment procedures after waiting at least 30 minutes.
5. Unless otherwise specified, prepare the most suitable reception or input signal for adjustment.
6. Never touch any adjustment parts which are not specified in the list for this adjustment - variable resistors, transformers, condensers, etc.
7. Presetting before adjustment.  
Unless otherwise specified in the adjustment instructions, preset the following functions with the remote control unit:

VIDEO STATUS	STANDARD
BASS, TREBLE, BALANCE	CENTER
TINT/COLOR PICTURE/BRIGHT DETAIL	CENTER

## ADJUSTMENT EQUIPMENT

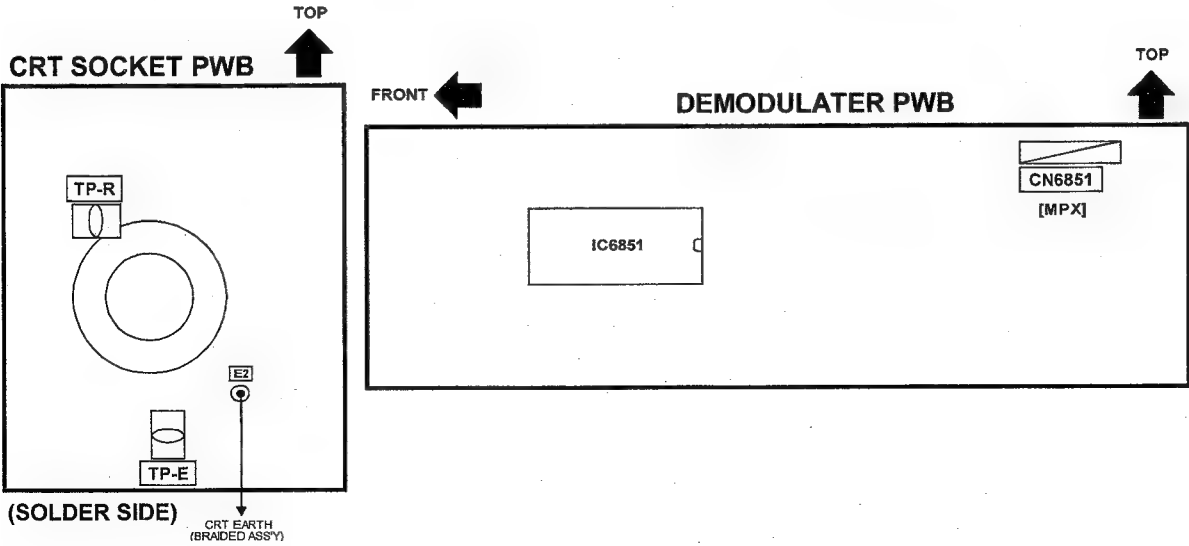
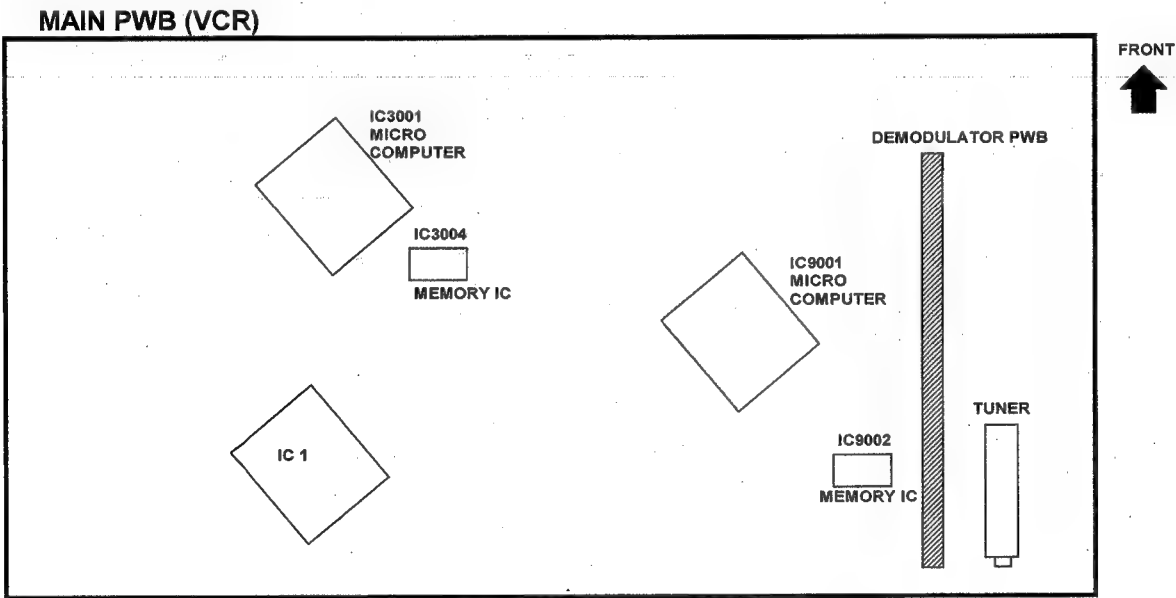
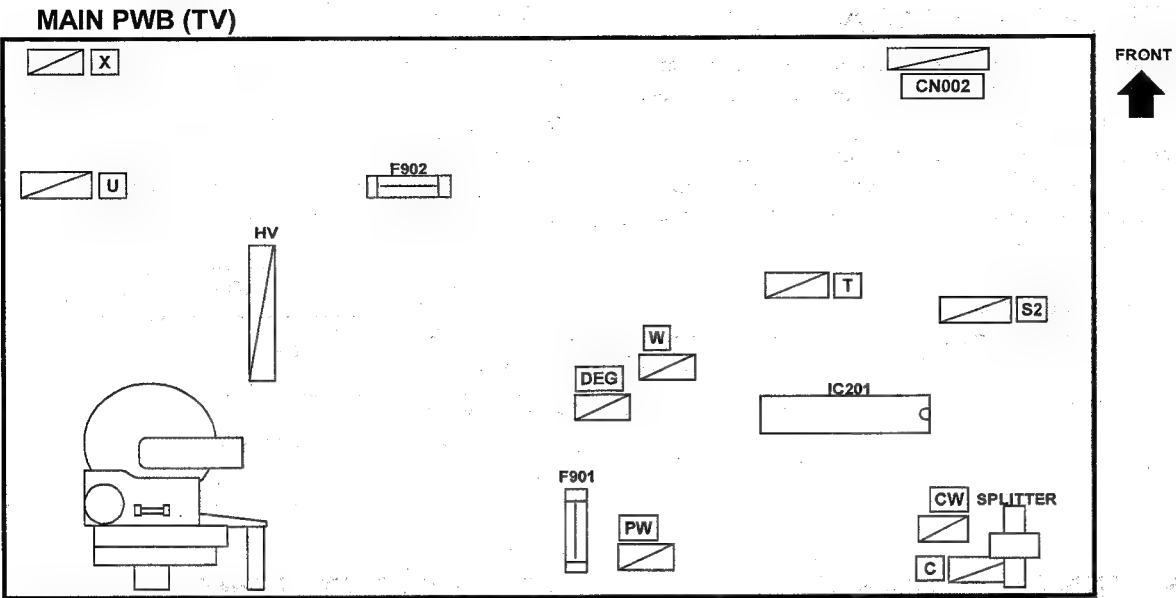
1. DC voltmeter (or digital voltmeter)
2. Oscilloscope
3. Signal generator (Pattern generator) [NTSC]
4. Remote control unit
5. TV audio multiplex signal generator.
6. Frequency counter

## ADJUSTMENT ITEMS

Adjustment items	Adjustment items	Adjustment items
High voltage check	WHITE BALANCE (High Light)	MTS INPUT LEVEL check
FOCUS	SUB BRIGHT	MTS STEREO VCO
V. SIZE	SUB CONTRAST	MTS SAP VCO
H. POSITION	SUB COLOR	MTS FILTER check
WHITE BALANCE (Low Light)	SUB TINT	MTS SEPARATION



ADJUSTMENT LOCATIONS



## BASIC OPERATION OF SERVICE MENU

### 1. Operate the SERVICE MENU with the REMOTE CONTROL UNIT.

### 2. In general, basic setting (adjustments) items or verifications are performed in the SERVICE MENU.

- PICTURE ..... This sets the setting values (adjustment values) of the VIDEO/CHROMA and DEFLECTION circuits.
- SOUND ..... This sets the setting values (adjustment values) of the AUDIO circuit.
- VIDEO STATUS ..... This is used when the VIDEO STATUS is adjusted.
- OTHERS ..... This sets the setting values (adjustment values) of the OTHERS circuit,
- LOW LIGHT ..... This sets the setting values (adjustment values) of the WHITE BALANCE circuit.
- HIGH LIGHT ..... This sets the setting values (adjustment values) of the WHITE BALANCE circuit.
- RF AFC ..... This is used when the IF VCO is adjusted. **[Do not adjust]**
- I2C BUS CTRL ..... This is used when ON / OFF of the I2C BUS CTRL is set. **[FIXED ON]**

### 3. Basic Operations of the SERVICE MENU

#### (1) How to enter the SERVICE MENU.

Press **SLEEP TIMER** key and, while the indication of "SLEEP TIMER 0 MIN." is being displayed, press **DISPLAY** key and **VIDEO STATUS** key on the remote control unit simultaneously to enter the **SERVICE MENU** screen ① shown in the next figure page.

#### (2) SERVICE MENU screen selection

Press the UP / DOWN key of the MENU to select any of the following items.

(The letters of the selected items are displayed in yellow.)

- PICTURE
- SOUND
- VIDEO STATUS
- OTHERS
- LOW LIGHT
- HIGH LIGHT
- RF AFC
- I2C BUS CTRL

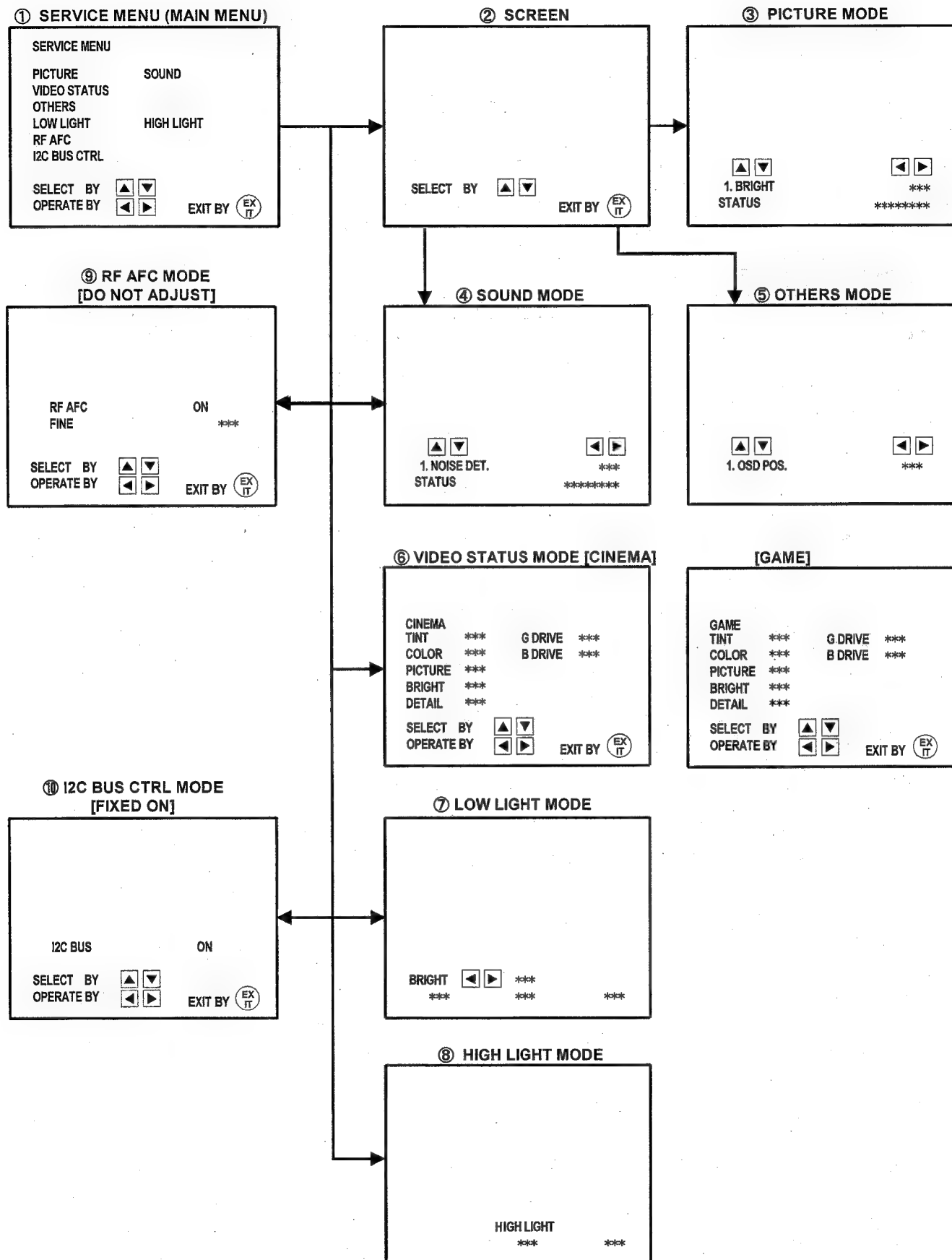
#### (3) Enter the any setting ( adjustment ) mode

##### ● PICTURE, SOUND and OTHERS mode

- 1) If select any of PICTURE, SOUND or OTHERS items, and the LEFT / RIGHT key is pressed from SERVICE MENU ( MAIN MENU ), the screen ② will be displayed as shown in figure page later.
- 2) Then the UP / DOWN key is pressed, the PICTURE mode screen ③ or the SOUND mode screen ④ or the OTHERS mode screen ⑤ is displayed, and the PICTURE, SOUND or OTHERS setting can be performed.

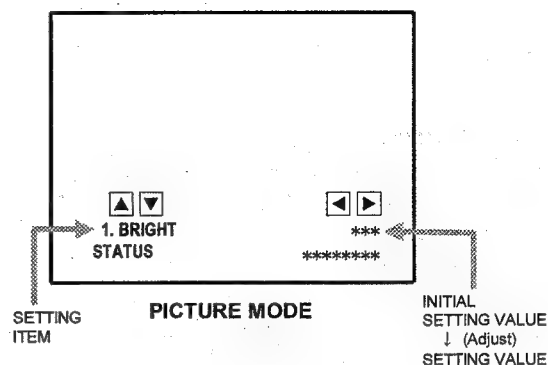
##### ● VIDEO STATUS, LOW LIGHT, HIGH LIGHT, RF AFC and I2C BUS CTRL mode

- 1) If select any of VIDEO STATUS / LOW LIGHT / HIGH LIGHT / RF AFC / I2C BUS CTRL items, and the LEFT / RIGHT key is pressed from SERVICE MENU ( MAIN MENU ), the screens ⑥ ⑦ ⑧ ⑨ ⑩ will be displayed as shown in figure page later.
- 2) Then the settings or verifications can be performed.



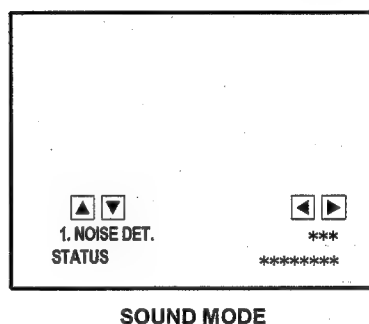
**(1) Setting method**

- 1) UP / DOWN key of the MENU  
Select the SETTING ITEM.
- 2) LEFT / RIGHT key of the MENU  
Setting (adjust) the SETTING VALUE of the SETTING ITEM.  
When the key is released the SETTING VALUE will be stored (memorized).
- 3) EXIT key  
Returns to the previous screen.

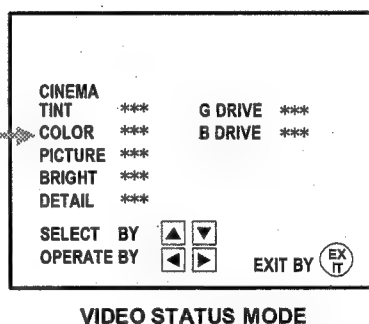
**(2) Releasing SERVICE MENU**

- 1) After returning to the SERVICE MENU upon completion of the setting (adjustment) work, press the EXIT key again.

★ The settings for LOW LIGHT and HIGH LIGHT are described in the WHITE BALANCE page of ADJUSTMENT.



(The letter of the selected items are displayed in yellow.)



## INITIAL SETTING VALUE OF SERVICE MENU

- Adjustment of the SERVICE MENU is made on the basis of the initial setting values; however, the new setting values which set the screen in its optimum condition may differ from the initial setting.
- Do not change the initial setting values of the setting (Adjustment) items not listed in "ADJUSTMENT".

### ● PICTURE MODE

- ✧ The four setting items in the video mode No.7 EXT BRI., No.8 EXT PIC., No.11 EXT TINT and No.12 EXT COLOR. are linked to the items in the TV MODE No.1 BRIGHT, No.2 PICTURE, No.5 TINT and No.6 COLOR, respectively. When the setting items in the TV mode are adjusted, the values in the setting items in the video mode are revised automatically to the same values in the TV mode.(The initial setting values given in ( ) are off-set values.)
- ✧ When the four items (No.7, 8, 11 and 12) are adjusted in the video mode, the setting values in each item are revised independently.

No.	Setting (Adjustment) items	Variable range	initial setting value
1.	BRIGHT	000~127	064
2.	PICTURE	000~127	076
3.	TV DTL(TV DETAIL)	000~063	026
4.	TV BPF(TV B.P.FILTER)	000 / 001	001
5.	TINT	000~127	070
6.	COLOR	000~127	048
7.	EXT BRI.(EXT.BRIGHT)	±025	(±000)
8.	EXT PICT.(EXT.PICTURE)	±025	(±000)
9.	EXT DETAIL	000~063	026
10.	EXT BPF(EXT.B.P.FILTER)	000 / 001	000
11.	EXT TINT	±025	(±000)
12.	EXT COLOR	±025	(±000)
13.	V SIZE	000~063	026
14.	H POSITION	000~031	026
15.	H. AFC	000 / 001	000

### ● SOUND MODE

No.	Setting (Adjustment) item	Variable range	Initial setting value
1.	NOISE DET.	000 / 001	001
2.	IN LEVEL (INPUT LEVEL)	000~063	029
3.	FM MONITOR	000 / 001	000
4.	STEREO VCO	000~063	020
5.	PILOT CAN. (PILOT CANCELER)	000 / 001	000
6.	FILTER	000~063	025
7.	LOW SEP. (LOW SEPARATION)	000~063	032
8.	HI SEP. (HI SEPARATION)	000~063	016
9.	5FH MON. (5FH MONITOR)	000 / 001	000
10.	SAP VCO	000~063	014
11.	IN GAIN (INPUT GAIN)	000 / 0001	000
12.	FIL. OFFSET.	-010~+010	±000



# ● OTHERS MODE

Nó.	Setting (Adjustment) item	Variable range	Initial setting value
1.	OSD POS.	000~007	000
2.	CCD POS. (CLOSED CAPTION DECODER POS.)	000~015	004
3.	EOSEL	000~001	000
4.	F1-FIELD	000~001	001
5.	F1-LINE21	000~015	008
6.	F2-LINE21	000~015	008
7.	MENU COLOR	-030~±000	-010
8.	MENU PICT.	-030~±000	-010
9.	MENU BRI.	-030~±000	-010

# ● VIDEO STATUS

Setting (Adjustment) item	Variable range	Initial setting value	
		CINEMA	GAME
TINT	-20~+20	±00	±00
COLOR	-20~+20	-03	±00
PICTURE	-30~+20	-20	-10
BRIGHT	-20~+20	±00	-05
DETAIL	-15~+15	-03	+05
G DRIVE	-99~+50	-25	±00
B DRIVE	-99~+50	-72	±00

# ● LOW LIGHT MODE

Setting (Adjustment) item	Variable range	initial setting value
R CUTOFF	0~255	020
G CUTOFF	0~255	020
B CUTOFF	0~255	020

# ● HIGH LIGHT MODE

Setting (Adjustment) item	Variable range	initial setting value
G DRIVE	0~255	128
B DRIVE	0~255	128

# ● RF AFC MODE

Setting (Adjustment) item	Variable range	initial setting value
RF AFC	ON / OFF	ON
FINE	-77~+77	± × ×

# ● I2C BUS CTRL MODE

Setting (Adjustment) item	Variable range	initial setting value
I2C BUS	ON / OFF	[Fixed ON]

## ■ ADJUSTMENTS

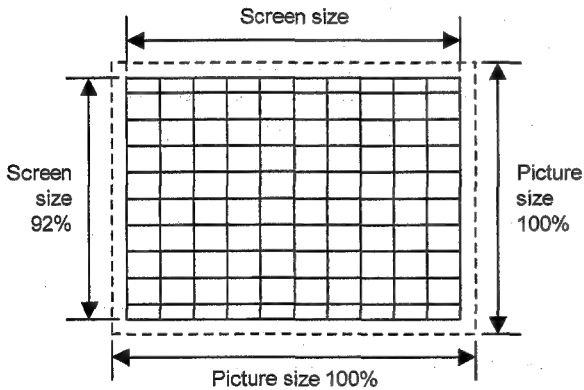
### CHECK OF HIGH VOLTAGE

Item	Measuring instrument	Test point	Adjustment part	Description
High voltage check	High voltage meter Signal generator	CRT anode	FOCUS VR [In FBT]	<ol style="list-style-type: none"> <li>1. Receive a black and white signal.</li> <li>2. Turn the SCREEN VR to make CUT-OFF picture.</li> <li>3. Connect the high voltage meter to the CRT anode and confirm the high voltage is 26.5kV <math>+1kV</math> <math>-1kV</math></li> </ol>

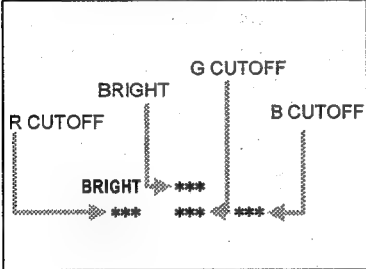
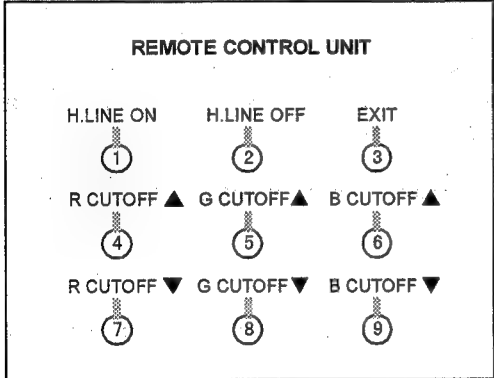
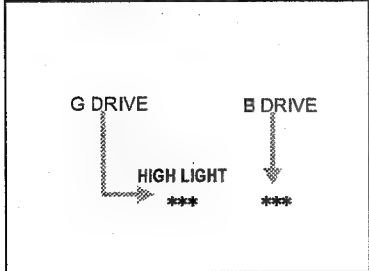
### ADJUSTMENT OF FOCUS

Item	Measuring instrument	Test point	Adjustment part	Description
FOCUS adjustment	Signal generator		FOCUS VR [In FBT]	<ol style="list-style-type: none"> <li>4. Receive a crosshatch signal.</li> <li>5. While looking at the screen, adjust FOCUS VR so that the vertical and horizontal lines will be clear and in fine detail.</li> <li>6. Make sure that the picture is in focus even when the screen gets darkened.</li> </ol>

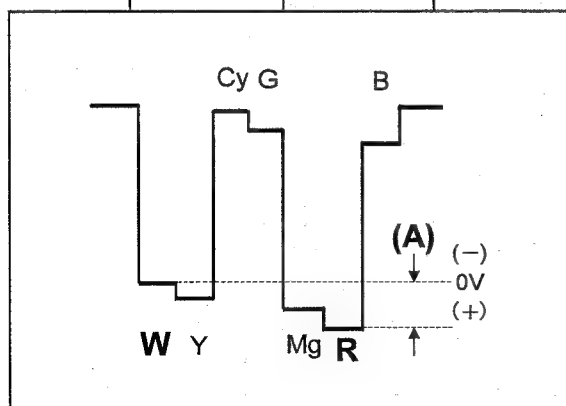
### ADJUSTMENT OF DEFLECTION CIRCUIT

Item	Measuring instruments	Test point	Adjustment part	Description
V.SIZE Adjustment	Signal generator		No.13 V.SIZE	<ol style="list-style-type: none"> <li>1. Receive a crosshatch signal.</li> <li>2. Select No.13 V.SIZE in the PICTURE MODE.</li> <li>3. Set the initial setting value of No.13 V.SIZE with the LEFT / RIGHT key of the MENU.</li> <li>4. Adjust No.13 V.SIZE until the vertical screen size is 92%.</li> </ol>
				
H.POSITION Adjustment	Signal generator		No.14 H.POS	<ol style="list-style-type: none"> <li>1. Receive a crosshatch signal.</li> <li>2. Select the No.14 H.POS of the PICTURE MODE.</li> <li>3. Set the initial setting value of the No.14 H.POS with the LEFT / RIGHT key of the MENU.</li> <li>4. Adjust the No.14 H.POS until the screen will be horizontally centered.</li> </ol>

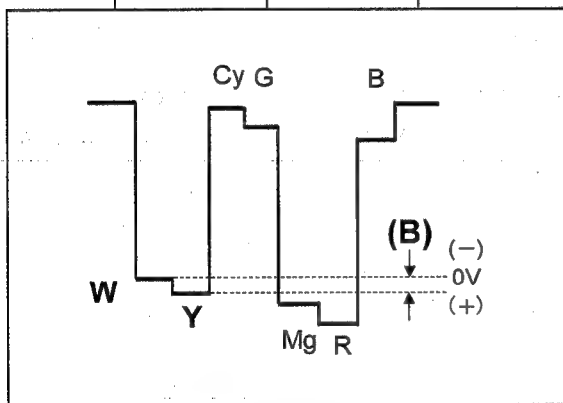
## ADJUSTMENT OF VIDEO / CHROMA CIRCUIT

Item	Measuring instruments	Test point	Adjustment part	Description
WHITE BALANCE (Low Light) Adjustment	Signal generator		<b>BRIGHT</b> <b>R. CUTOFF</b> <b>G. CUTOFF</b> <b>B. CUTOFF</b>  <b>SCREEN VR</b> <b>[In FBT]</b>	<ol style="list-style-type: none"> <li>1. Receive a black-and-white signal. (Color off)</li> <li>2. Select the <b>[LOW LIGHT]</b> MODE from the SERVICE MENU.</li> <li>3. Set the initial setting value of BRIGHT with the LEFT / RIGHT key of the remote control unit.</li> <li>4. Set the initial setting value of R CUTOFF, G CUTOFF and B CUTOFF with the ④ to ⑨ key of the remote control unit.</li> <li>5. Display a single horizontal line by pressing the ① key of the remote control unit.</li> <li>6. Turn the screen VR all the way to the left.</li> <li>7. Turn the screen VR gradually to the right from the left until either one of the red, blue or green colors appears faintly.</li> <li>8. Adjust the two colors which did not appear until the single horizontal line that is displayed becomes white using the ④ to ⑨ keys of the remote control unit.</li> <li>9. Turn the screen VR to where the single horizontal line glows faintly.</li> <li>10. Press the ② key to return to the regular screen.</li> </ol> <p>* The ③ EXIT key is the cancel key for the WHITE BALANCE.</p>
<p align="center"><b>[LOW LIGHT] MODE</b></p>  <p align="center"><b>REMOTE CONTROL UNIT</b></p> 				
WHITE BALANCE (High Light) Adjustment	Signal generator		<b>G. DRIVE</b> <b>B. DRIVE</b>	<ol style="list-style-type: none"> <li>1. Receive a monoscope pattern signal.</li> <li>2. Select the <b>[HIGH LIGHT]</b> MODE in the SERVICE MENU.</li> <li>3. Set the initial setting value of G DRIVE and B DRIVE with the ⑤, ⑥, ⑧ and ⑨ keys of the remote control unit.</li> <li>4. Adjust the screen until it becomes white using the ⑤, ⑥, ⑧ and ⑨ keys of the remote control unit.</li> </ol> <p>* The ③ (EXIT) key is the cancel key for the WHITE BALANCE.</p>
<p align="center"><b>[HIGH LIGHT] MODE</b></p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p align="center"><b>Remote Control Unit</b></p> <p>① key : H.LINE ON</p> <p>② key : H.LINE OFF</p> <p>③ key : EXIT</p> <p>⑤ key : G DRIVE ▲</p> <p>⑥ key : B DRIVE ▲</p> <p>⑧ key : G DRIVE ▼</p> <p>⑨ key : B DRIVE ▼</p> </div>				

Item	Measuring instrument	Test point	Adjustment part	Description
SUB BRIGHT adjustment			No.1 BRIGHT	<ol style="list-style-type: none"> <li>1. Receive the broadcast.</li> <li>2. Select <b>No.1 BRIGHT</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.1 BRIGHT</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. If the brightness is not the best with the initial setting value, make fine adjustment of the <b>No.1 BRIGHT</b> until you get the optimum brightness.</li> </ol>
SUB CONTRAST adjustment			No.2 PICTURE	<ol style="list-style-type: none"> <li>1. Receive the broadcast.</li> <li>2. Select <b>No.2 PICTURE</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.2 PICTURE</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. If the contrast is not the best with the initial setting value, make fine adjustment of the <b>No.2 PICTURE</b> until you get the optimum contrast.</li> </ol>
SUB COLOR adjustment	Remote control unit		No.6 COLOR	<p>[ Method of adjustment without measuring instrument ]</p> <ol style="list-style-type: none"> <li>1. Receive the broadcast.</li> <li>2. Select <b>No.6 COLOR</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.6 COLOR</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. If the color is not the best with the Initial setting value, make fine adjustment of the <b>No.6 COLOR</b> until you get the optimum color.</li> </ol>
	Signal generator  Oscilloscope  Remote control unit	TP-R TP-E(↕) [CRT SOCKET PWB]	No.6 COLOR	<p>[ Method of adjustment using measuring instrument ]</p> <ol style="list-style-type: none"> <li>1. Receive a full field colour bar signal(75% white).</li> <li>2. Select <b>No.6 COLOR</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.6 COLOR</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. Connect the oscilloscope between <b>TP-R</b> and <b>TP-E</b>.</li> <li>5. Adjust COLOR and bring the value of <b>(A)</b> in the illustration to +18V (Voltage difference between White and Red).</li> </ol>



Item	Measuring instrument	Test point	Adjustment part	Description
SUB TINT adjustment	Remote control unit		No.5 TINT	<b>[ Method of adjustment without measuring instrument ]</b> <ol style="list-style-type: none"> <li>1. Receive the broadcast.</li> <li>2. Select <b>No.5 TINT</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.5 TINT</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. If the tint is not the best with the initial setting value, make fine adjustment of the <b>No.5 TINT</b> until you get the optimum tint.</li> </ol>
	Signal generator  Oscilloscope  Remote control unit	TP-R TP-E(↓) [CRT SOCKET PWB]	No.5 TINT	<b>[ Method of adjustment using measuring instrument ]</b> <ol style="list-style-type: none"> <li>1. Receive a full field colour bar(75% white).</li> <li>2. Select <b>No.5 TINT</b> of the PICTURE MODE.</li> <li>3. Set the initial setting value of the <b>No.5 TINT</b> with the LEFT/RIGHT key of the MENU.</li> <li>4. Connect the oscilloscope between <b>TP-R</b> and <b>TP-E</b>.</li> <li>5. Adjust TINT and bring the value of <b>(B)</b> in the illustration to +10V (Voltage difference between Whit and Yellow).</li> </ol>

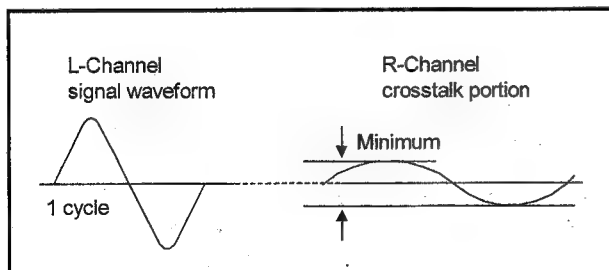


### ADJUSTMENT OF MTS CIRCUIT

Item	Measuring instrument	Test point	Adjustment part	Description
MTS INPUT LEVEL check			No.2 IN LEVEL	<ol style="list-style-type: none"> <li>1. Select the "No.2 IN LEVEL" of the SOUND MODE.</li> <li>2. Verify that the "No.2 IN LEVEL" is set at its initial setting value.</li> </ol>
MTS STEREO VCO adjustment	Signal generator  Frequency counter	<b>[MPX]</b> CN6851 Connector [On DEMODULATOR] <b>[2] pin</b>	No.3 FH MON.  No.4 ST VCO	<ol style="list-style-type: none"> <li>1. Receive a RF signal (nonmodulated sound signal) from the antenna terminal.</li> <li>2. Select the "No.3 FH MONITOR" of SOUND MODE, and change the setting value from 0 to 1.</li> <li>3. Connect the Frequency Counter to pin <b>[2]</b> of <b>[MPX]</b> connector.</li> <li>4. Select the "No.4 STEREO VCO".</li> <li>5. Set the initial setting value of the "No.4 STEREO VCO" with the LEFT/RIGHT key of the menu.</li> <li>6. Adjust the "No.4 STEREO VCO" so that the Frequency Counter will display <math>15.73\text{kHz} \pm 0.1\text{kHz}</math>.</li> <li>7. Select the "No.3 FH MONITOR" of the SOUND MODE, and reset the setting value from 1 to 0.</li> </ol>



Item	Measuring instrument	Test point	Adjustment part	Description
MTS SAP VCO adjustment	Signal generator  Frequency counter	【MPX】 Connector CN6851 On DEMODULATOR PWB 【4】 pin SDA 【3】 pin GND 【2】 pin RTV	No.9 5FH MON.  No.10 SAP VCO	<ol style="list-style-type: none"> <li>1. Receive a RF signal (non modulated sound signal) from the antenna terminal.</li> <li>2. Connect between pin 【4】 of 【MPX】 connector and GND (Pin 【3】 of 【MPX】 connector) through 1M<math>\Omega</math> Resistor.</li> <li>3. Select the "No.9 5FH MON." of the SOUND MODE, and reset the setting value from 0 to 1.</li> <li>4. Connect the Frequency Counter to pin 【2】 (R.OUT) of 【MPX】 connector.</li> <li>5. Select the "No.10 SAP VCO".</li> <li>6. Set the initial setting value of "No.10 SAP VCO" with the LEFT/RIGHT key of the menu.</li> <li>7. Adjust the "No.10 SAP VCO" so that the Frequency Counter will display 78.67kHz<math>\pm</math>0.5kHz.</li> <li>8. Select the "No.9 5FH MON." of the SOUND MODE, and reset the setting value from 1 to 0.</li> </ol>
MTS FILTER check			No.6 FILTER	<ol style="list-style-type: none"> <li>1. Select the "No.6 FILTER" of the SOUND MODE.</li> <li>2. Verify that the "No.6 FILTER" is set at its initial setting value.</li> </ol>
MTS SEPARATION adjustment	TV audio multiplex signal generator  Oscilloscope	【MPX】 Connector CN6851 On DEMODULATOR PWB 【1】 pin LTV 【2】 pin RTV	No.7 LOW SEP.  No.8 HI SEP.	<ol style="list-style-type: none"> <li>1. Input a stereo L signal (300Hz) from the TV audio multiplex signal generator to the antenna terminal.</li> <li>2. Connect an oscilloscope to pin 【1】 (L OUT) of 【MPX】 connector, and display one cycle portion of the 300Hz signal.</li> <li>3. Change the connection of the oscilloscope to pin 【2】 (R OUT) of 【MPX】 connector, and enlarge the voltage axis.</li> <li>4. Select the "No.7 LOW SEP." of the SOUND MODE.</li> <li>5. Set the initial setting value of the "No.7 LOW SEP." with the LEFT/RIGHT key of the menu.</li> <li>6. Adjust the "No.7 LOW SEP." so that the stroke element of the 300Hz signal will become minimum.</li> <li>7. Change the signal to 3kHz, and similarly adjust the "No.8 HI SEP."</li> </ol>



## HOW TO CHECK THE HIGH VOLTAGE HOLD DOWN CIRCUIT

## 1. HIGH VOLTAGE HOLD DOWN CIRCUIT

After repairing the high voltage hold down circuit shown in Fig. 1.

This circuit shall be checked to operate correctly.

## 2. CHECKING OF THE HIGH VOLTAGE HOLD DOWN CIRCUIT

- (1) Turn the POWER SW ON.
- (2) As shown in Fig. 1, set the resistor (between [X] connector [1] & [3] ).
- (3) Make sure that the screen picture disappears.
- (4) Temporarily unplug the power cord.
- (5) Remove the resistor (between [X] connector [1] & [3] ).
- (6) Again plug the power cord, make sure that the normal picture is displayed on the screen.

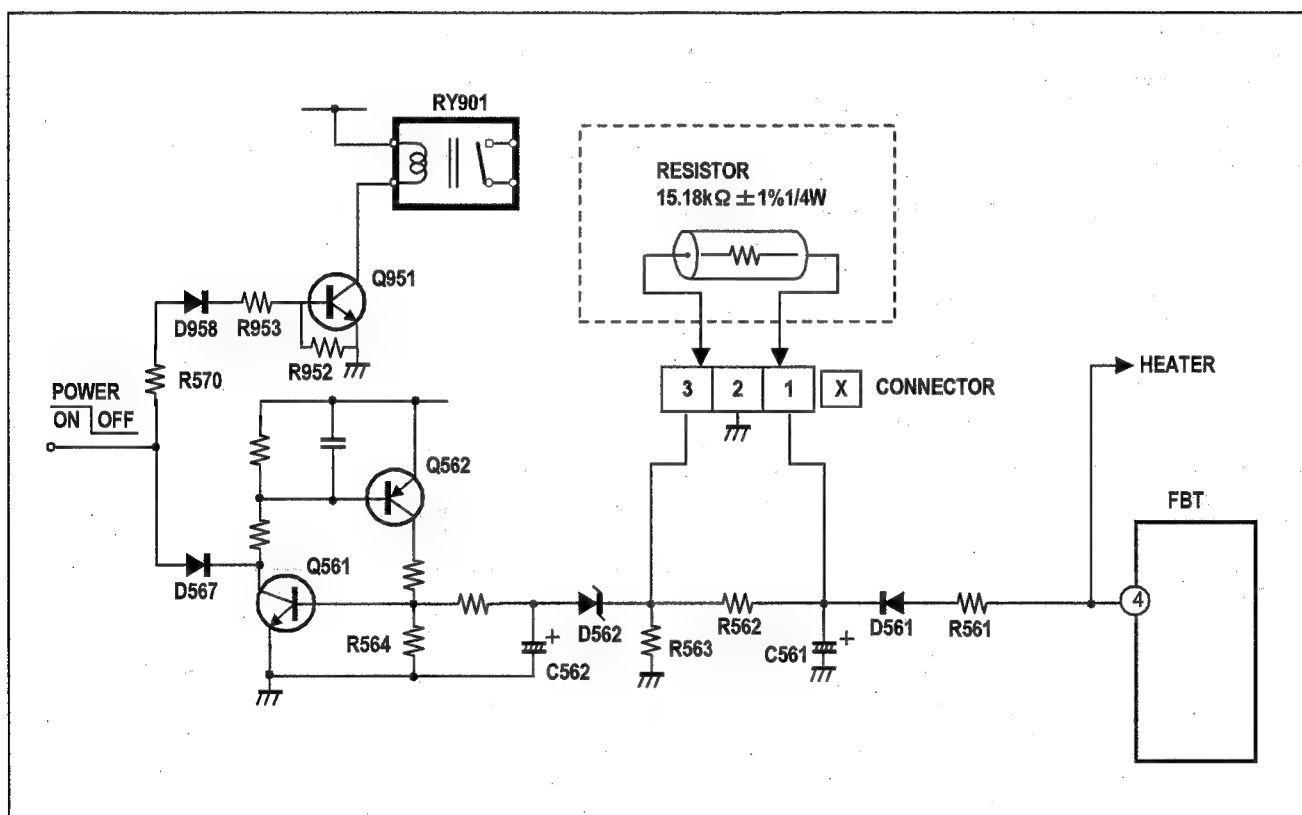


Fig. 1

SELF CHECK FUNCTIONS

1. Outline

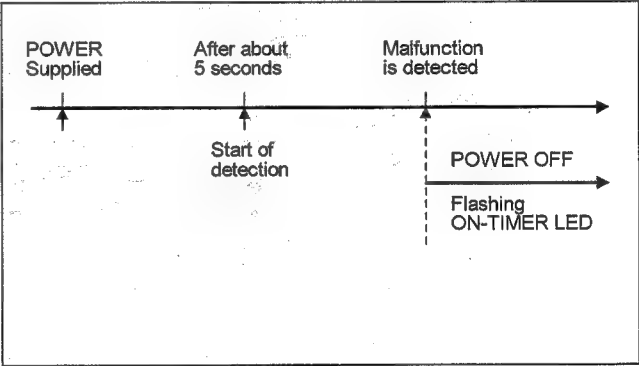
This model has self check functions given below. When a malfunction has been detected, the POWER is turned off and the LED flashes to inform of the failure . The malfunction is detected by the signal input state of the control line connected to the microcomputer.

2. Self check items

Check item	Details of detection	Method of detection	State of malfunction
VCR emergency	Abnormality of VCR mechanism is detected.	If an emergency information is sent during the communication with VCR microcomputer, a malfunction is interpreted.	Although the POWER is turned off, the power key of the remote controller is operational
CRT NECK protector <div>Also detected if the power supply line output from the FBT (High voltage Transformer) has shorted with the ground.</div>	When the vertical circuit S-correction capacitor C427 is shorted, detect the potential drop of the C427, and prevent the burn damage to the CRT NECK. (Grounding of shorting of the power supply output from the HVT to the vertical circuit, and the small signal power supply is also detected.)	The microcomputer detects at 1 second intervals. If NG is detected for more than 1 ms, a malfunction is interpreted.	When a malfunction has been detected, the POWER is turned off. While the POWER is being turned off , the power key of the remote controller is not operational until the power code is taken out and put in again.

3. Self check indicating function

The self-check function begins detection about 5 seconds after power is supplied.  
In the event a malfunction is detected, the power is cut off immediately.  
At this time, the ON-TIMER LED flashes to inform of the malfunction.



[ON-TIMER LED indication]

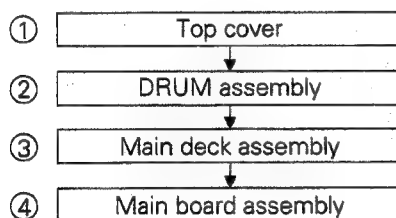
Item	LED flashing intervals
VCR emergency	LED flash alternately at 0.25-second intervals
CRT NECK protector	LED flash alternately at 0.5-second intervals

# SPECIFIC SERVICE INSTRUCTIONS(VCR)

## SECTION 1 DISASSEMBLY PROCEDURE

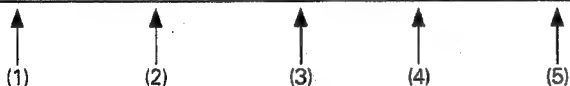
### 1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



### 1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	6(S1), 2(S2)	
②	DRUM ASSEMBLY	D2	3(S3),WR1,WR2	<NOTE 1>
③	MAIN DECK ASSEMBLY	D3	2(S4),2(S5),WR3, 2(L1),*CN2001	<NOTE 2>
④	MAIN BOARD ASSEMBLY	D4	2(S5), 2(L2), VTR BRACKET	



(1) Order of steps in Procedure

When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.

(2) Part name to be removed or installed.

(3) Fig.No. showing procedure or part location

(4) Identification of part to be removed,unhooked,unlocked, released,unplugged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, \* = Unhook,unlock, release,unplug or unsolder.

(5) Adjustment information for installation

### 1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	6(S1), 2(S2)	
②	DRUM ASSEMBLY	D2	3(S3),WR1,WR2	<NOTE 1>
③	MAIN DECK ASSEMBLY	D3	2(S4),2(S5),WR3, 2(L1),*CN2001	<NOTE 2>
④	MAIN BOARD ASSEMBLY	D4	2(S5), 2(L2), VTR BRACKET	

#### <NOTE1>

- When plugging the connector in, check that the flat wire is inserted properly and fully.

#### <NOTE2>

- When it is required to remove the screws (S4) retaining the Main deck assembly, please refer to the "Procedures for Lowering the Cassette holder assembly"(See on pages 25).
- When removing the Main deck assembly, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Main deck assembly.
- When attaching the Main deck assembly to the Main board assembly, take care not to damage the sensors and switches on the Main board assembly (D3001:LED, Q3001:Start sensor, Q3002:End sensor).

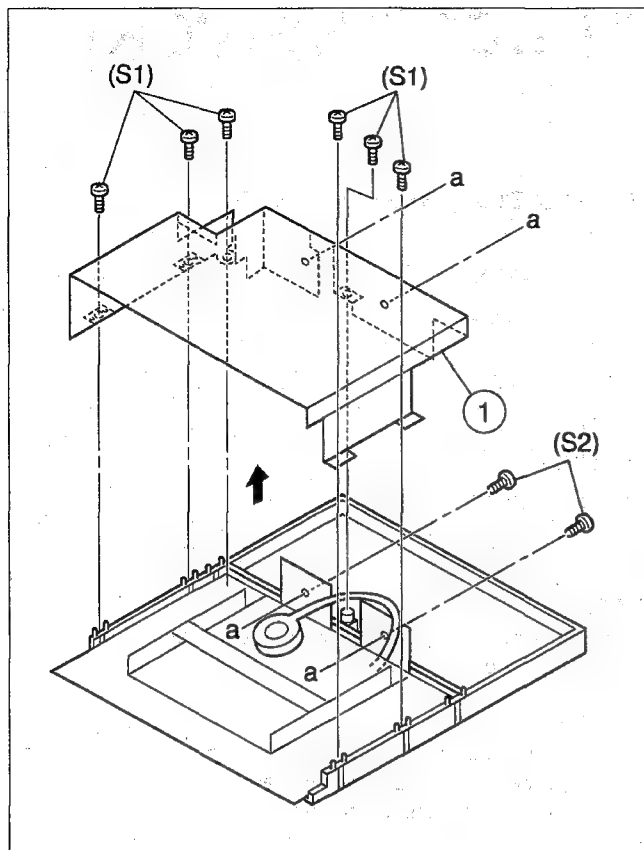


Fig. D1

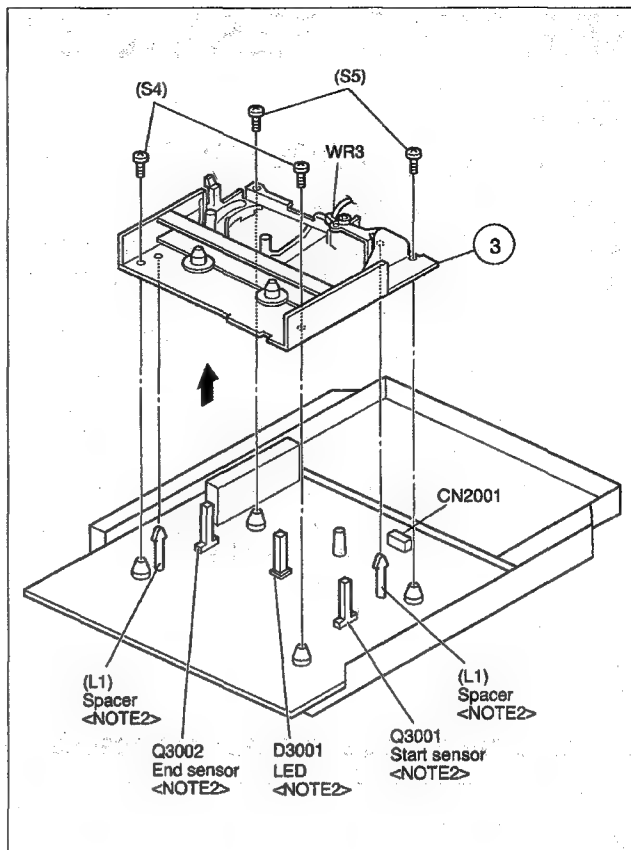


Fig. D3

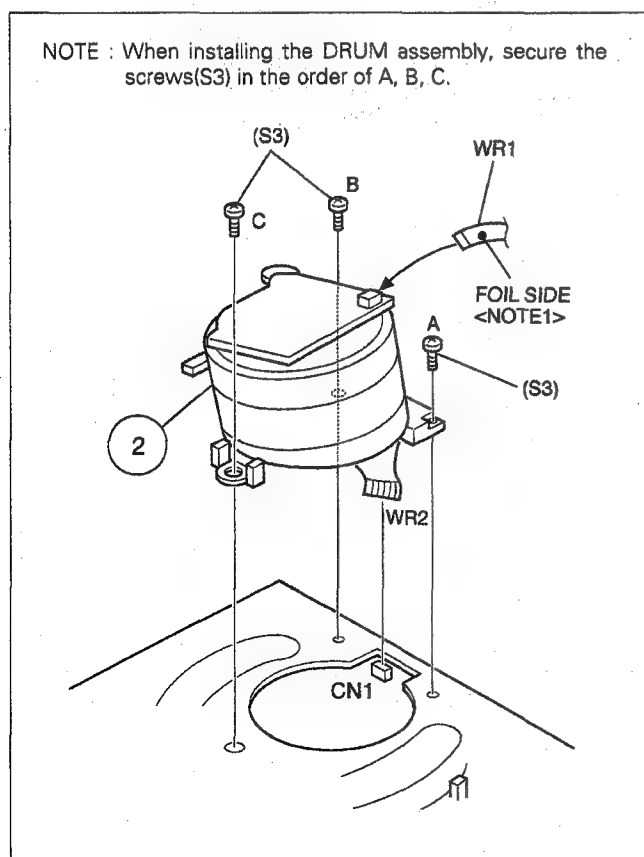


Fig. D2

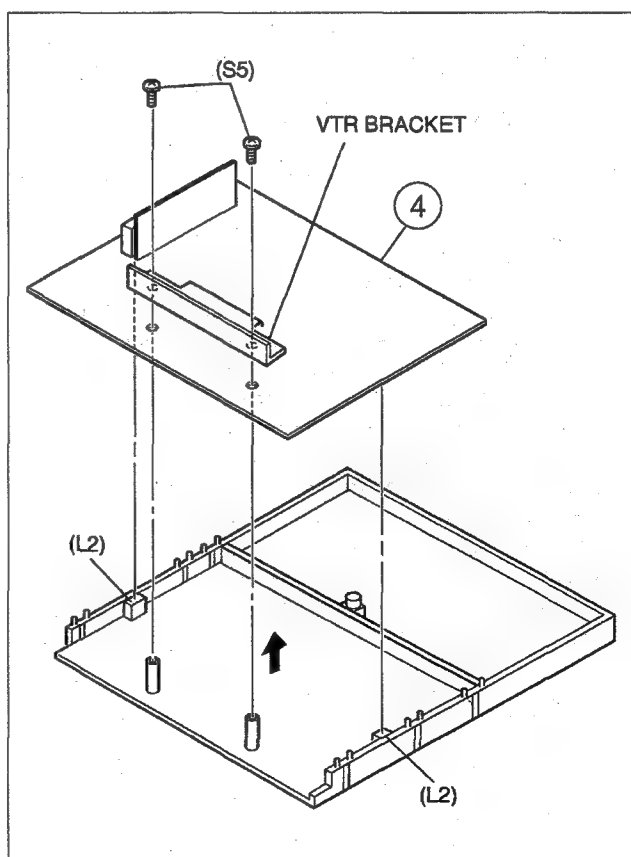


Fig. D4



### Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two bolts unscrewed when removing the Main deck assembly.

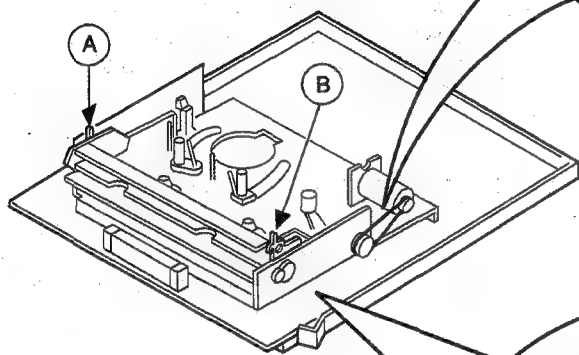


Fig. 1

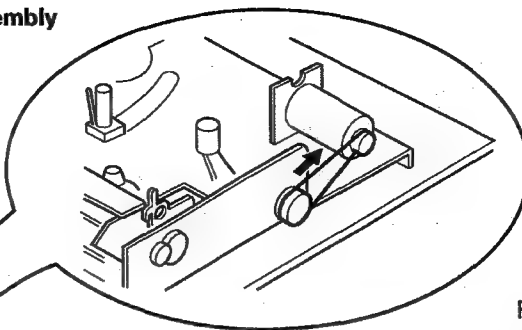


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both (A) and (B) levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of (A), (B), (B), (A). When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

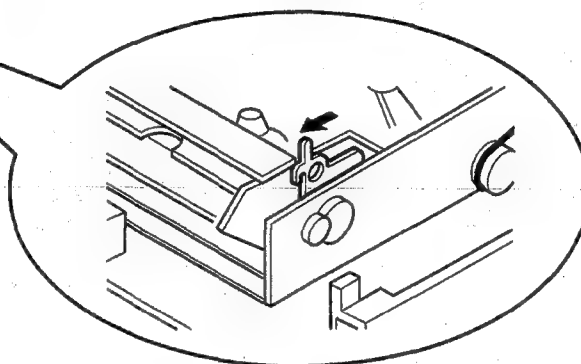


Fig. 3

## 1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Main deck assembly, this unit is constructed so as to allow the Main deck and the Main board assemblies to be removed together from the Chassis assembly.

### 1.4.1 How to take out the Mechanism and Main board assemblies

- (1) Remove the Top cover (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
- (2) Lower the cassette holder, and make the preparations required in order to remove the bolts from the Main deck assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 25 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
- (3) Take out the 2 screws (A) and 2 screws (B). (See Fig. 1-4-1.)
- (4) Take out the 2 screws (C) and remove the Front bracket.
- (5) Remove the VTR bracket. (See Fig. D4 on pages 24.)
- (6) Remove the 2 hooks on the Main board, and remove the Main board and Main deck assemblies together. At this stage be careful of the power cord and prongs of the jacks on the front side. (See Fig. 1-4-2.)

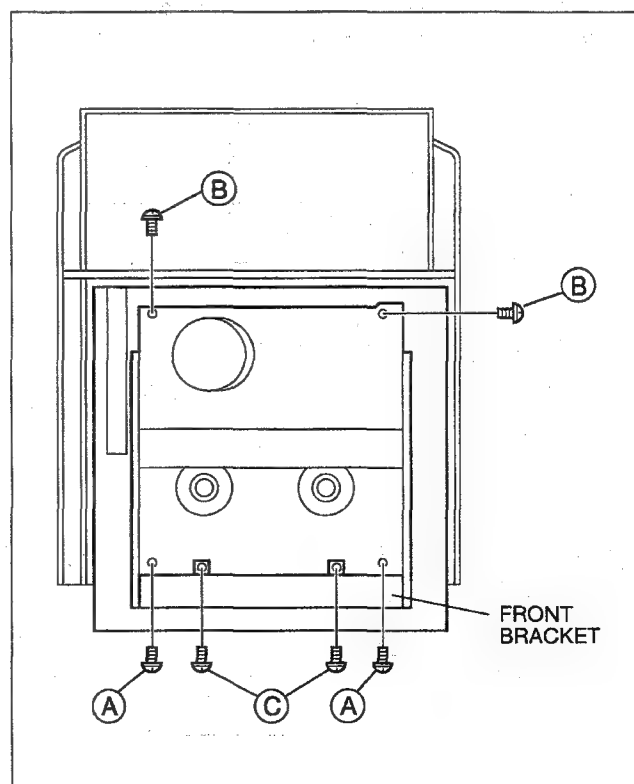


Fig. 1-4-1

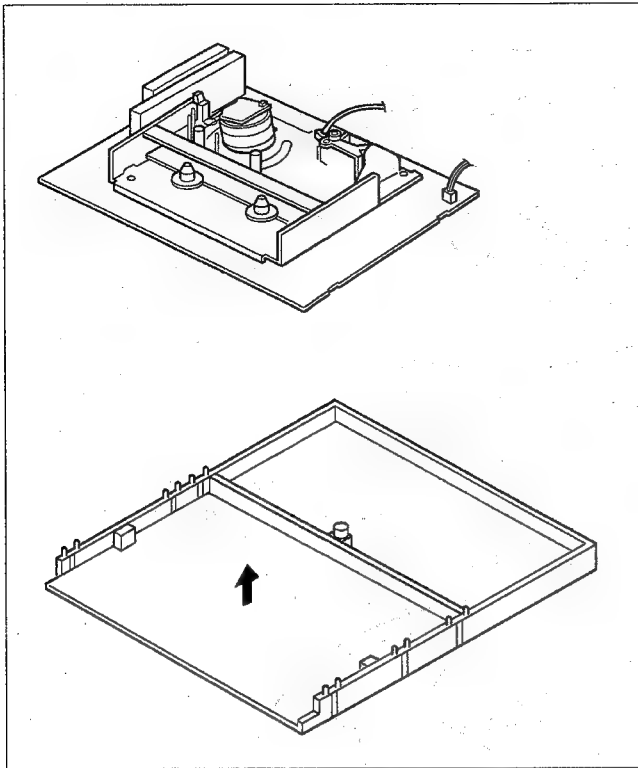


Fig. 1-4-2

- (7) Connect the power cord to the wall socket, and lift the cassette holder.  
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)
- (8) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Main deck assemblies together.

**Notes :** • When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Main deck assemblies.

If they are improperly grounded, there may be noise on the playback picture.

- When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position (the status shown in Fig. 1-4-2).

### 1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

#### 1.5.1 How to set the "MECHANISM SERVICE MODE"

- (1) Disconnect VCR from AC.
- (2) Connect TPGND and TP7001(TEST) on the Display board assembly with a jump wire.
- (3) Connect VCR to AC.
- (4) Press the power button.
- (5) With lock levers (A)(B) on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers (A)(B), refer to the "Procedures for Lowering the Cassette holder assembly" on pages 25 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
- (6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

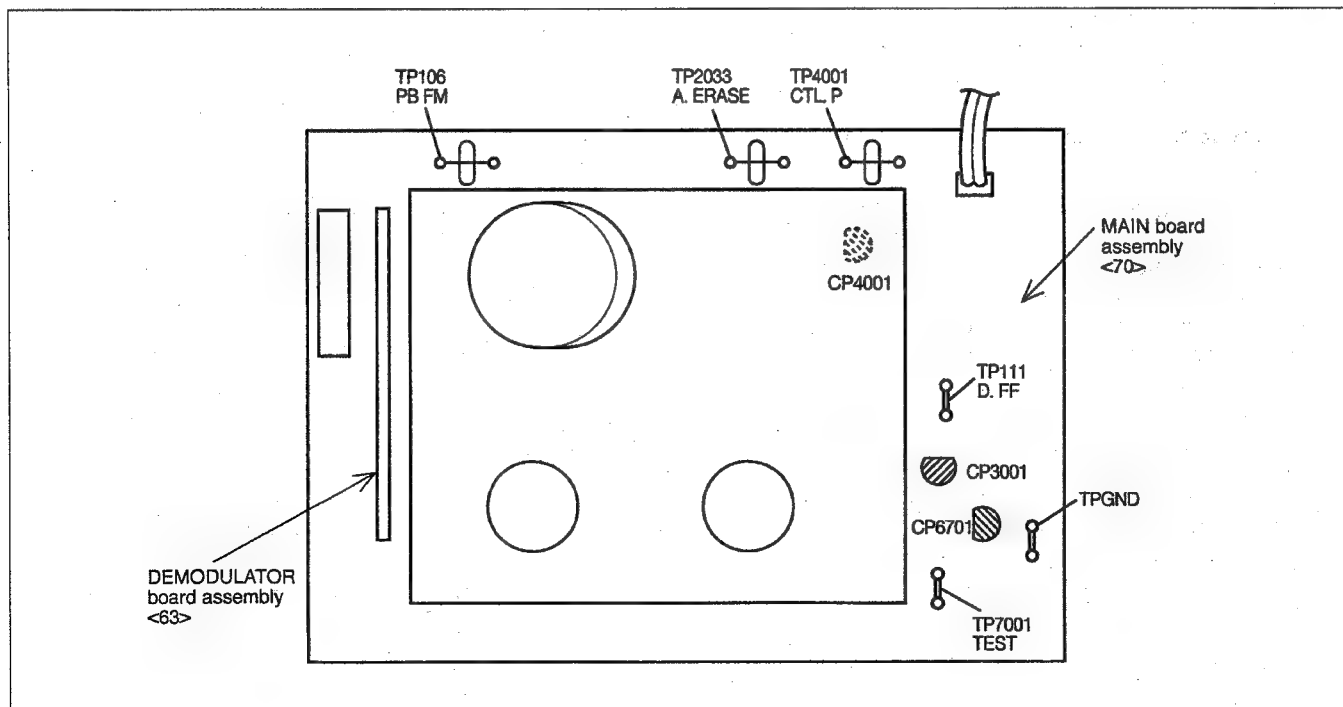


Fig. 1-5-1

No.51520

## 1.6 SYSCON CIRCUIT

### 1.6.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	NC	-	NC
2	START SENSOR	IN	LEADER TAPE DETECT(DETECT ON:L)
3	CTL GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
4	NC	-	NC
5	END SENSOR	IN	TRAILER TAPE DETECT(DETECT ON:L)
6	NC	-	NC
7	NC	-	NC
8	A.ENV/ND(L)	-	NC
9	VIDEO ENV.	IN	INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
10	PROTECT	IN	SW5V/12V DETECT(FOR EMERGENCY)
11	NC	-	NC
12	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
13	N.REC ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START:H
14	NC	-	NC
15	REC(H)	OUT	AUDIO RECORDING MODE(REC:H)
16	NC	-	NC
17	NC	-	NC
18	D.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
19	A.FF	-	NC
20	NC	-	NC
21	V.DOWN(L)	OUT	CAPSTAN MOTOR SPEED CONTROL
22	NC	-	NC
23	A.MUTE(H)	OUT	AUDIO MUTE CONTROL(MUTE ON:H)
24	NC	-	NC
25	NC	-	NC
26	LMC1	OUT	LOADING MOTOR DRIVE(1)
27	LMC2	OUT	LOADING MOTOR DRIVE(2)
28	LMC3	OUT	LOADING MOTOR DRIVE(3)
29	CAS.INS.SW	-	NC
30	REC SAFETY	IN	REC SAFETY SWITCH DETECT(SW ON:L)
31	LSC	IN	MECHANISM MODE DETECT(C)
32	LSB	IN	MECHANISM MODE DETECT(B)
33	LSA	IN	MECHANISM MODE DETECT(A)
34	NUB	-	NC
35	NUA	-	NC
36	CLK_SEL	-	NC
37	VCC	-	SYSTEM POWER
38	X IN	-	TIMER CLOCK(12MHz)
39	X OUT	-	TIMER CLOCK(12MHz)
40	VSS	-	GND
41	XC IN	-	NC
42	XC OUT	-	NC
43	RESET	-	RESET TERMINAL FOR POWER SUPPLY
44	P CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY(POWER ON:H)
45	SP(H)	OUT	MODE SELECT(SP MODE:H)
46	NC	-	NC
47	NC	-	NC
48	NC	-	NC
49	TU_MUTE(H)	OUT	TUNER MUTE CONTROL(MUTE ON:H)
50	NC	-	NC

Table 1-6-1 SYSCON CPU pin function(1/2)

## 1.6.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
51	NC	-	NC
52	NC	-	NC
53	NC	-	NC
54	NC	-	NC
55	NC	-	NC
56	NC	-	NC
57	P MUTE(L)	OUT	PICTURE MUTE CONTROL(MUTE ON:L)
58	OPTION 2	-	NC
59	H.REC.ST(L) OUT	-	NC
60	EE(L)	OUT	EE MODE(REC:L/PB:H)
61	BUSY	OUT	BUSY SIGNAL FOR VIDEO
62	PB(L)	-	NC
63	DOCTOR	-	NC
64	OPTION 1	-	NC
65	T DATA OUT	OUT	VIDEO CONTROL DATA OUTPUT
66	T DATA IN	IN	VIDEO CONTROL DATA INPUT
67	T CLK	IN	VIDEO CONTROL DATA TRANSFER CLOCK INPUT
68	NC	-	NC
69	NC	-	NC
70	NC	-	NC
71	TEST/I2C CLK	OUT	MECHANISM TEST SIGNAL/SERIAL DATA TRANSFER CLOCK
72	I2C DATA	IN	I/O DATA INPUT
73	PB SEP(L)	-	NC
74	NC	-	NC
75	CE	IN	VIDEO REQ CONTROL INPUT
76	CAP REV(L)	OUT	CAPSTAN MOTOR DRIVE CONTROL(FWD:H/REW:L)
77	CAP CTL V	OUT	CAPSTAN MOTOR CONTROL
78	DRUM CTL V	OUT	DRUM MOTOR CONTROL
79	SP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
80	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
81	NC	-	NC
82	MECHA TEST	IN	MECHANISM SERVICE MODE CONTROL
83	C	-	NC
84	C.SYNC	IN	COMPOSITE SYNCHRONIZING SIGNAL INPUT
85	C.FG IN	IN	CAPSTAN FG PULSE INPUT(TAPE SPEED/BACK SPACE COUNT)
86	D.PG IN	IN	DRUM PICKUP PULSE INPUT(SWITCHING PULSE)
87	D.FG IN	IN	DRUM FG PULSE INPUT
88	AMP VSS	-	GND
89	AMP V REF OUT	OUT	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
90	AMP V REF IN	-	NC
91	CTL-	IN/OUT	CONTROL SIGNAL(-)
92	CTL+	IN/OUT	CONTROL SIGNAL(+)
93	CTL SW OUT	OUT	CONTROL PULSE OUTPUT
94	CTL AMP IN	IN	CONTROL PULSE INPUT
95	AMP C	IN	CAPACITOR CONNECT TERMINAL FOR CTL AMP CIRCUIT
96	CTL VSS	-	CONTROL AMP VSS
97	CTL AMP OUT	OUT	CONTROL PULSE OUTPUT
98	AMP VCC	-	POWER INPUT FOR ANALOG AMP
99	AVCC	-	ANALOG POWER
100	TU_LED	-	NC

Table 1-6-2 SYSCON CPU pin function(2/2)

# SERVICE ADJUSTMENTS(VCR)

## SECTION 2 MECHANISM ADJUSTMENT

### 2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

#### 2.1.1 Precautions

- (1) Unplug the power cable of the main unit before using your soldering iron.
- (2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
- (3) Do not randomly handle the parts without identifying where the trouble is.
- (4) Exercise enough care not to hurt yourself, especially your finger nails, during the repair work.
- (5) When installing the front panel assembly, be sure to hook the lug on the back side of cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

#### 2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE)

#### 2.1.3 Manually Removing the Cassette Tape

##### 1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD)
- (2) Unload the cassette by manually turning the unloading motor of the main deck assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1)
- (3) Bring the pole base assembly (on the supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
- (4) Move the top plate toward the drum while holding down the lug **A** of the bracket retaining the top plate. Likewise hold part **B** down and remove the top plate. The spring plate **C** is then brought under the cassette lid. Then remove the top plate by pressing the whole cassette tape down. (Note 1) (See Fig.2-1-2).
- (5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
- (6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

**Note:** The spring plate of the top plate is sharp-edged. Take care not to hurt yourself.

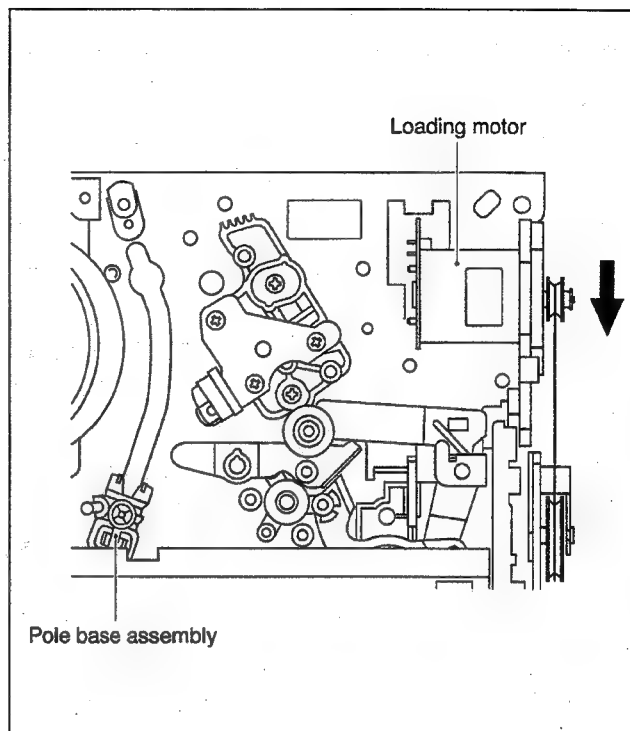


Fig. 2-1-1

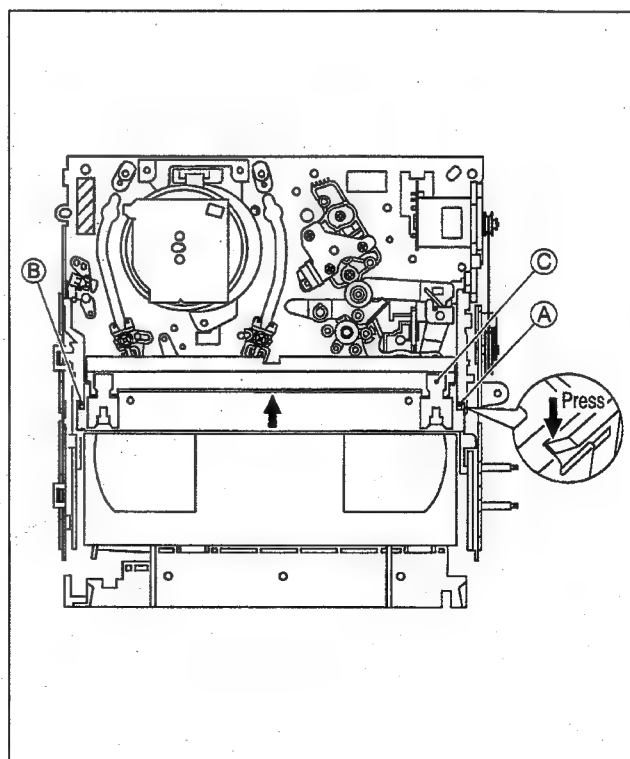


Fig. 2-1-2

## 2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover, bracket and front panel assembly (See 1.3 DISASSEMBLY/ASSEMBLY METHOD).
- (2) While keeping the tension arm of the main deck assembly free from tension, pull the tape on the pole base assembly out of the guide roller (on the supply or take-up side) (See Fig.2-1-3).
- (3) Remove the top plate as done in Step (4) of "1. In case of electrical failures" and remove the guide pole cap at the same time. (See Fig.2-1-4).
- (4) While lifting the cassette tape lid, hold the cassette tape case and pinch roller by the fingers and move them toward the loading motor to relieve pressure on the tape. Then remove the tape while taking the cassette case out of the cassette holder. (See Fig.2-1-4).
- (5) Re-place the guide pole cap and take up the slack of the tape into the cassette.

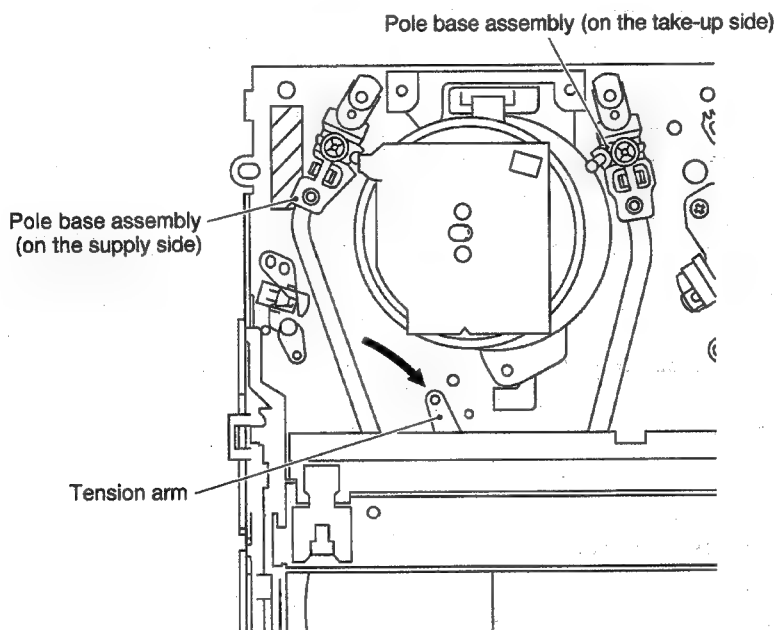


Fig. 2-1-3

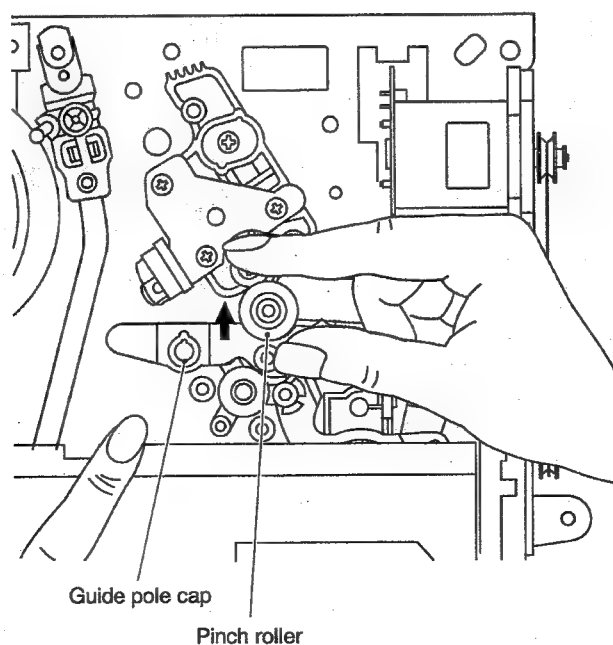


Fig. 2-1-4

### 2.1.4 Jigs and Tools Required for Adjustment

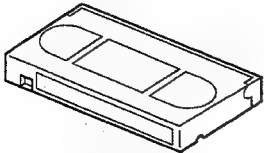
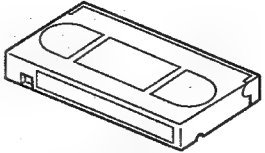
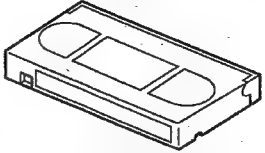

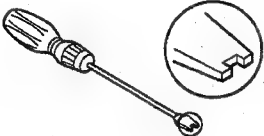
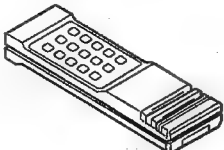
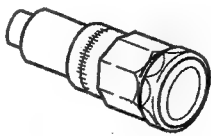
Alignment tape (SP) MHP	Alignment tape (EP) MHP-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

### 2.1.5 Maintenance and Inspection

#### 1. Location of major mechanical parts

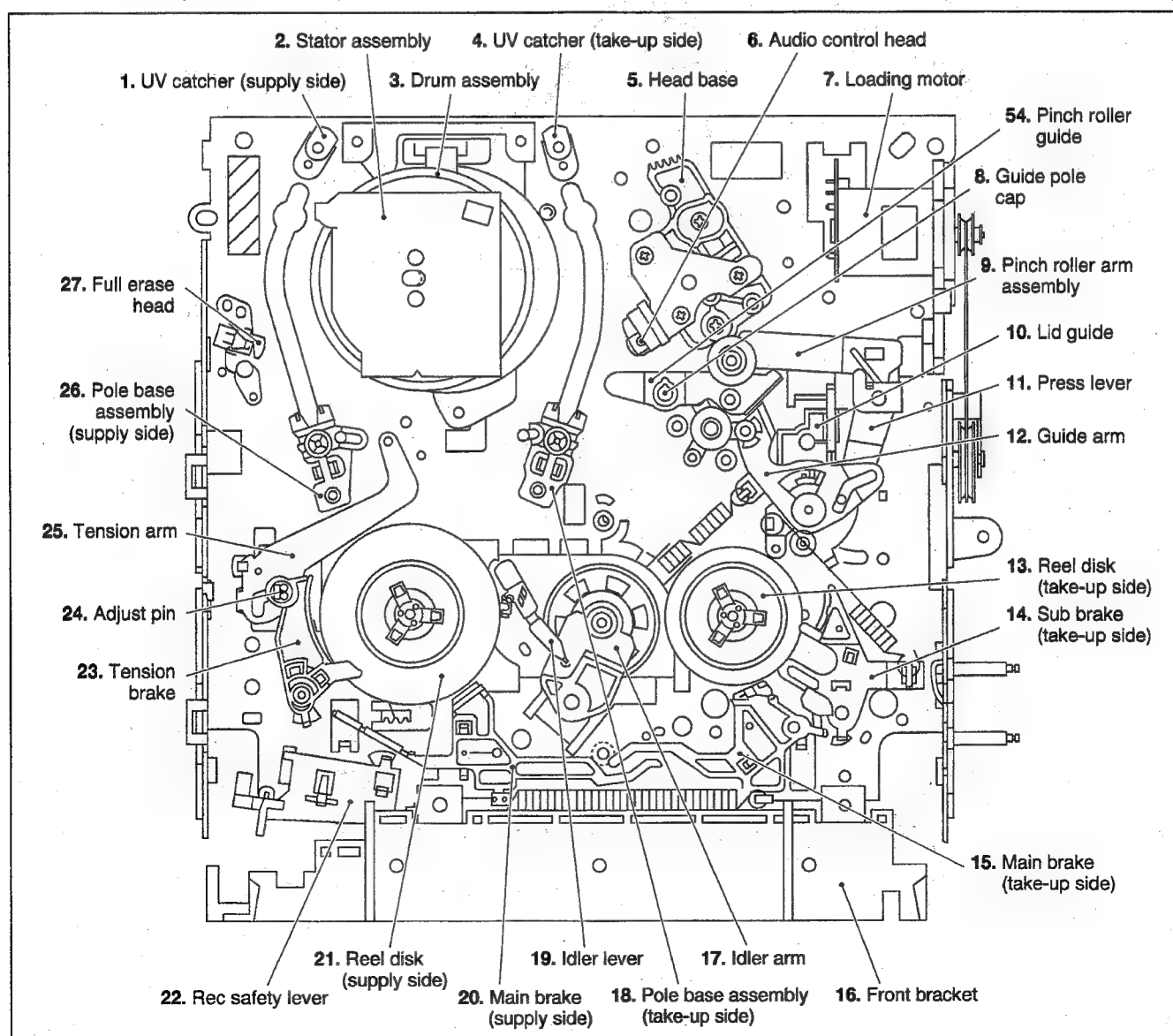


Fig. 2-1-5 Main deck top side



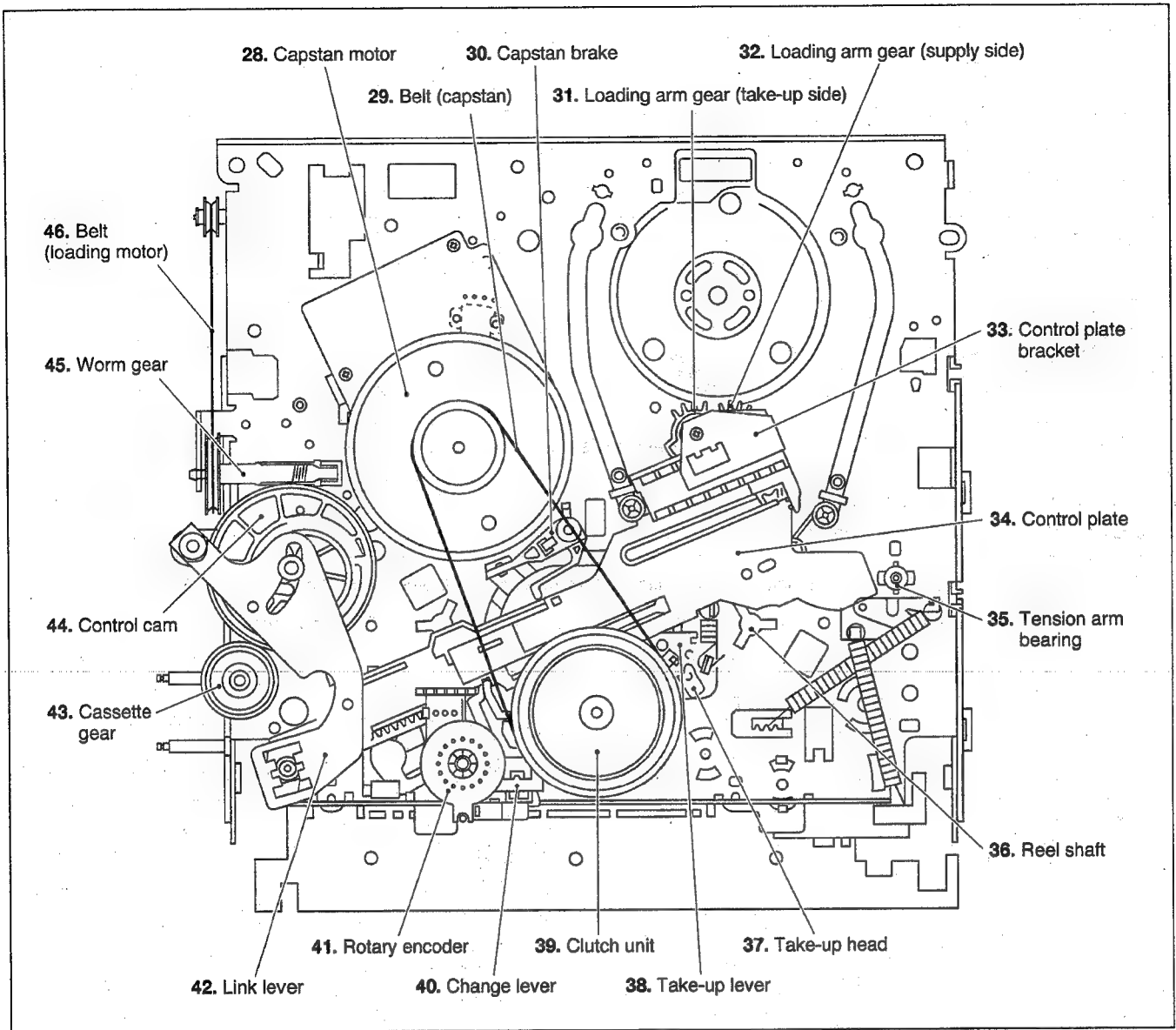


Fig. 2-1-6 Main deck bottom side

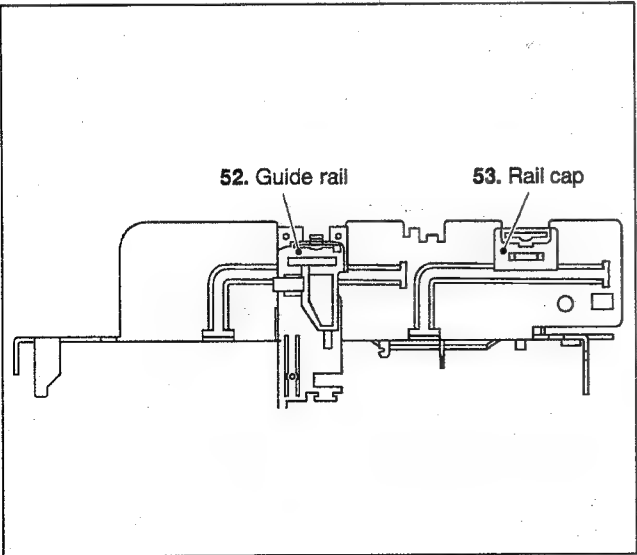


Fig. 2-1-7 Main deck left side

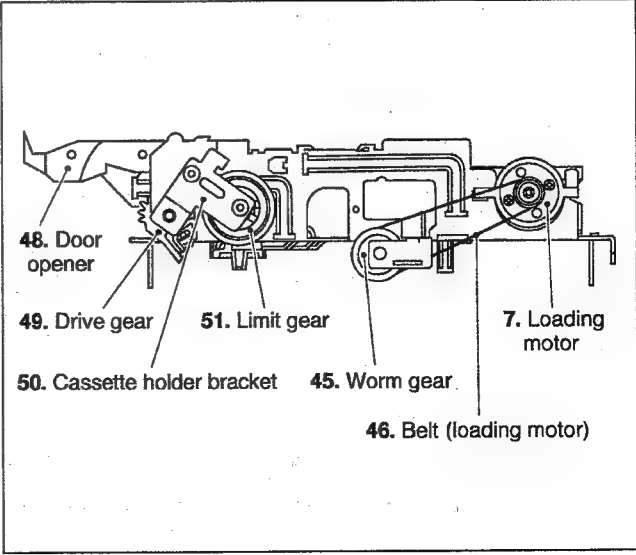


Fig. 2-1-8 Main deck right side

**Note:** Numerals at the start of the parts names are identical with those of the location diagrams of the major mechanical parts, 1 - 18 of which denote the order of removal. Of the alphabets T and B next to the parts names, T denotes removal from the main deck top side, B from the bottom side and T/B from both sides.

			1,4	12	53	46	9	52	11	50	-	-	-	49	32	-	-	38	25	23	31	16	21	42	41	29	39	40	33	34	14	19		
	Removable parts names		UV catcher	Guide arm assembly	Rail cap	Belt (loading motor)	Pinch roller arm assembly	Guide rail	Press lever assembly	Cassette Holder bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Loading arm gear (supply side)	Drive arm assembly	Tension spring	Take-up lever	Tension arm assembly	Tension brake assembly	Loading arm gear (take-up side)	Front bracket	Reel base (supply side)	Link lever	Rotary encoder	Belt (capstan motor)	Clutch unit	Change lever	Control plate bracket	Control plate	Sub brake	Idle lever		
17	Idler arm	T			1			2	3	4	5	6	7		8					9		10	11	12	13	14	15	16	17		18			
15	Main brake (take-up side)	T/B			1			2	3	4	5	6	7		8							9	10	11	12	13	14	15	16	17				
13	Reel disk (take-up side)	T			1			2	3	4	5	6	7		8							9	10	11	12	13	14	15	16	17				
19	Idler lever	T/B			1			2	3	4	5	6	7		8					9		10	11	12	13	14	15	16	17					
-	Rotary encoder guide	T/B			1			2	3	4	5	6	7		8							9	10	11	12	13	14	15	16	17				
14	Sub brake (take-up side)	T/B			1			2	3	4	5	6	7		8							9	10	11	12	13	14	15	16	17				
-	Loading arm gear shaft	B													8						9		1	2	3	4	5	6	7					
35	Tension arm bearing	T			1			2	3	4	5	6					8		9	7														
-	Control plate guide	T/B																8						1	2	3	4	5	6	7				
37	Take-up head	B																8						1	2	3	4	5	6	7				
31	Loading arm gear (take-up side)	B													8									1	2	3	4	5	6	7				
25	Tension arm assembly	T/B			1			2	3	4	5	6					8			7														
20	Main brake (supply side)	T/B			1			2	3	4	5	6	7		8																			
38	Take-up lever	T/B																							1	2	3	4	5	6	7			
32	Loading arm gear (supply side)	B																						1	2	3	4	5	6	7				
21	Reel disk (supply side)	T			1			2	3	4	5	6	7																					
-	Drive arm assembly	T			1			2	3	4	5	6	7																					
30	Capstan brake	T/B																							1	2	3	4	5	6	7			
34	Control plate	B																							1	2	3	4	5	6				
23	Tension brake assembly	T/B			1			2	3	4	5	6																						
-	Cassette holder assembly	T			1			2	3	4	5																							
-	Direct gear	B																								1	2	3	4					
10	Lid guide	T			1			2	3																									
40	Change lever	B																								1	2	3						
49	Drive gear	T								1	2	3																						
11	Press lever assembly	T			1			2																										
-	Relay gear	T								1	2																							
51	Limit gear assembly	T								1	2																							
26	Pole base assembly (supply side)	T/B	1																															
18	Pole base assembly (take-up side)	T/B	1																															
-	Tension spring (Main brake)	T																				1												
22	Rec safety lever	T/B																				1												
28	Capstan motor	T/B																									1							
45	Worm gear	B				1																												
44	Control cam	B																						1										
43	Cassette gear	B																						1										
39	Clutch unit	B																									1							
9	Pinch roller arm assembly	T			1																													
-	Opener guide	T								1																								
8	Guide pole cap	T																																
54	Pinch roller guide	T																																
1,4	UV catcher	T																																
42	Link lever	B																																
41	Rotary encoder	B																																
12	Guide arm assembly	T																																
50	Cassette holder bracket	T																																
52	Guide rail	T																																
53	Rail cap	T																																
7	Loading motor assembly	T																																
5	A/C head assembly	T																																

## 2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

- (1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

**Note:** Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.

- (2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.
- (3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

## 3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

- (1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the dis-assembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

## 4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake		○
	Main brake		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear assembly		○
	Control plate		○
Other	Brush assembly	★○	★○
	Tension brake	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

## 2.2 REPLACEMENT OF MAJOR PARTS

### 2.2.1 Before Starting Disassembling

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.

This mode is usually not in use, manually set it when it is required.

### 2.2.2 How to Set the Mechanism Assembling Mode

Remove the main deck assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY). Turn the worm gear toward the front so that the register hole of the control cam is brought into alignment with the hole at the main deck assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1)

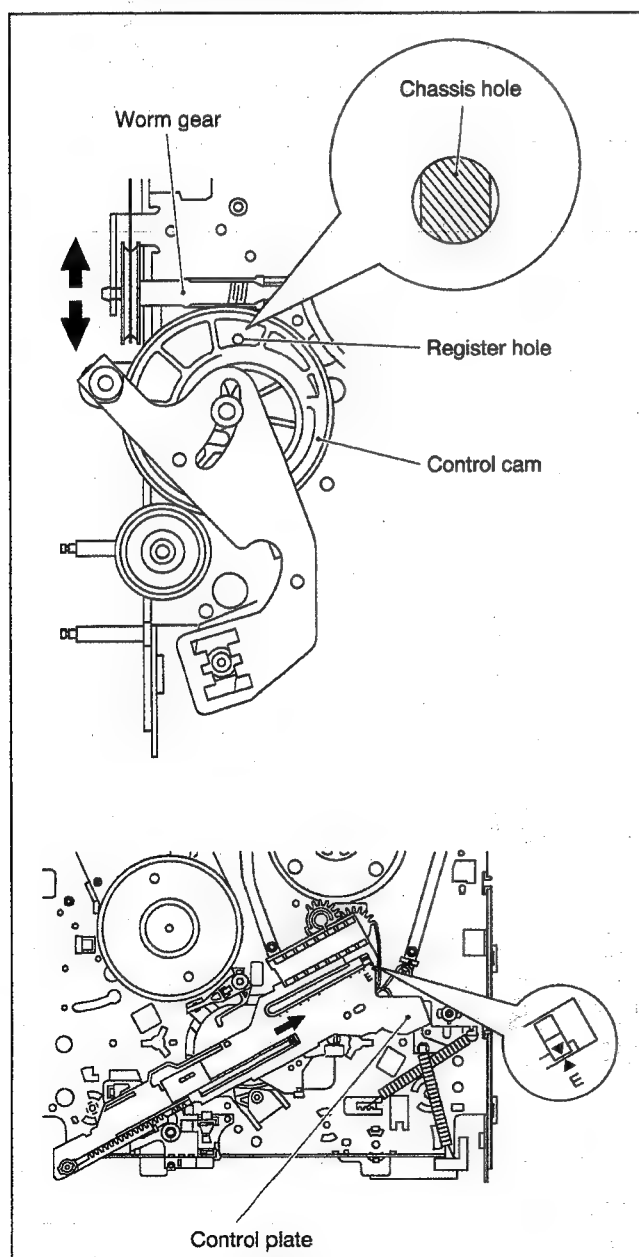


Fig. 2-2-1

### 2.2.3 Cassette Holder Assembly

#### 1. How to remove

- (1) Remove the guide rail and rail cap. (See Fig.2-2-2).
- (2 lugs on the guide rail and one lug on the rail cap)

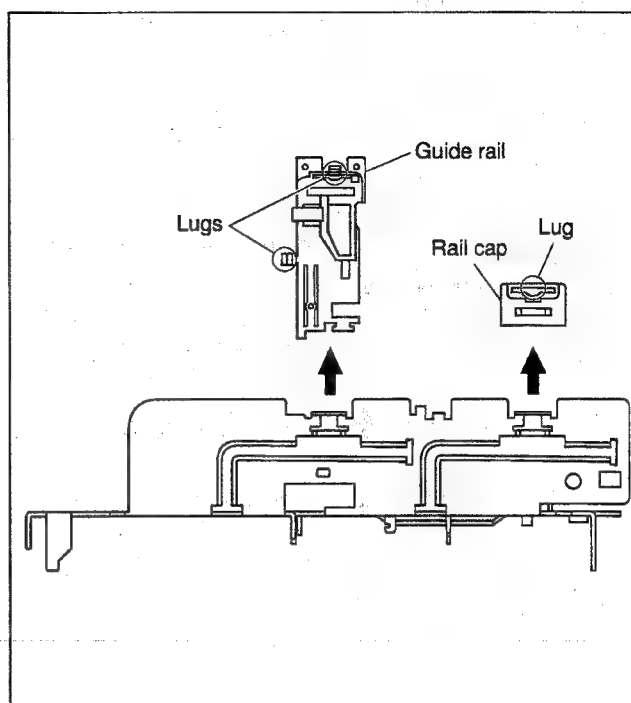


Fig. 2-2-2

- (2) Remove the two slit washers and remove the cassette holder bracket. (See Fig.2-2-3)
- (3) Remove the opener guide, relay gear and limit gear. (See Fig.2-2-3)

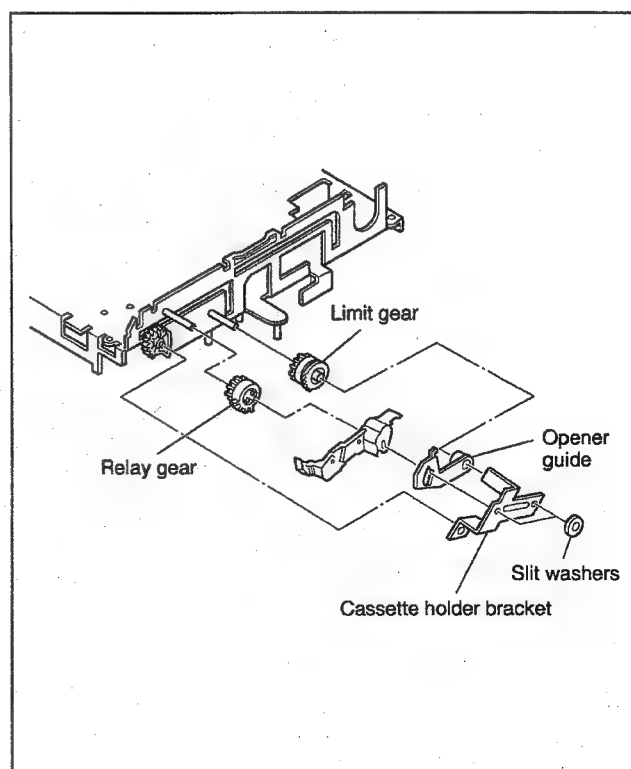


Fig. 2-2-3

- (4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the rail cap have been removed (so that the drive arm is upright). (See Fig.2-2-4)

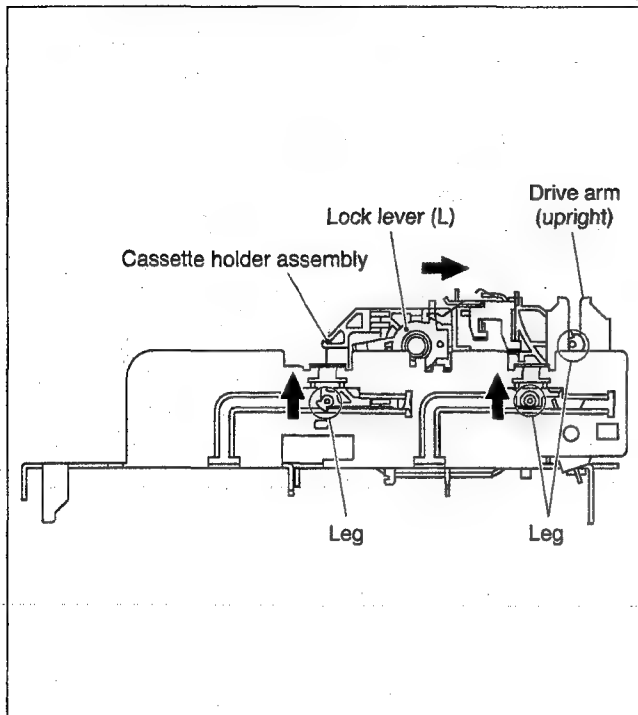


Fig. 2-2-4

- (5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs (A) and (B) on the right side out of the rail and also pull up the leg (C). (See Fig.2-2-5, Fig.2-2-6)

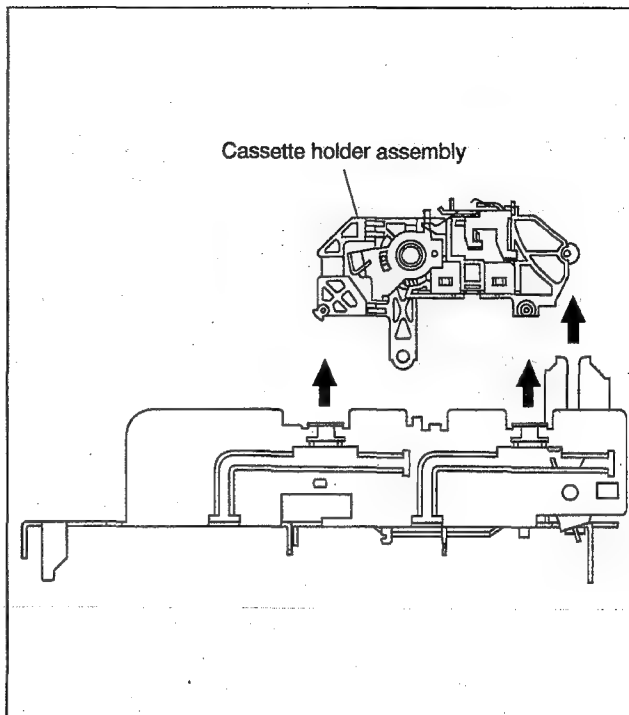


Fig. 2-2-5

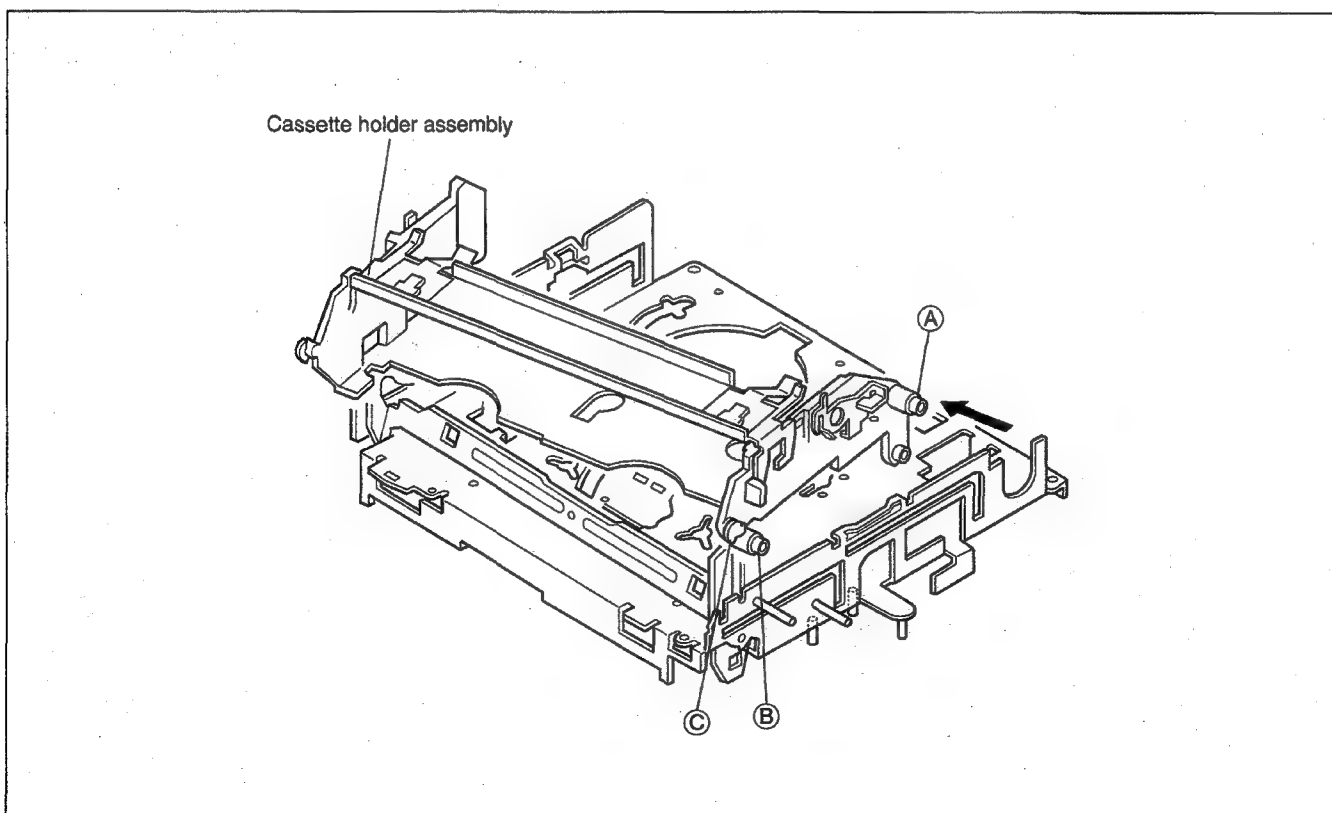


Fig. 2-2-6

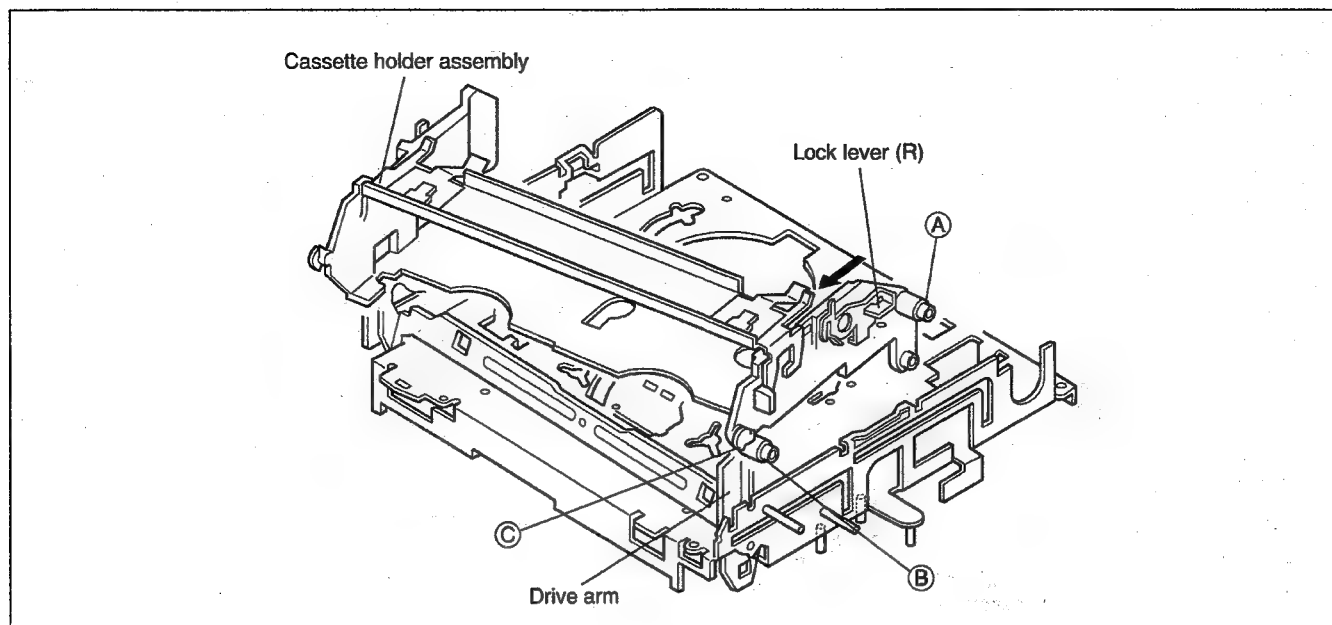


Fig. 2-2-7

## 2. How to install

- (1) Hold the drive arm upright and fit the leg © on the right side of the cassette holder assembly into the groove. (See Fig.2-2-7)
- (2) While swinging the lock lever (R) of the cassette holder assembly toward front, put the legs A and B into the rail. (See Fig.2-2-7)
- (3) Drop the three legs on the left side of the cassette holder into the groove at one time. (See Fig.2-2-8)
- (4) Slide the whole cassette holder toward the front to bring it to the eject end position.
- (5) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the register hole on the main deck. (See Fig.2-2-9)
- (6) Install the relay gear so that the notch on the outer circumference of the relay gear is brought into alignment with the notch on the main deck. It is important at this stage that the register hole at the limit gear, the register hole at the relay gear and the register hole at the drive gear are all in alignment. (See Fig.2-2-9).
- (7) Install the door stopper, opener guide and cassette holder bracket and fasten the two slit washers.

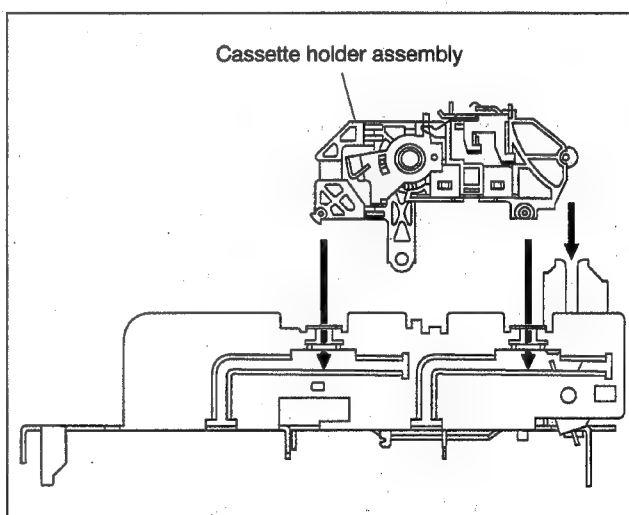


Fig. 2-2-8

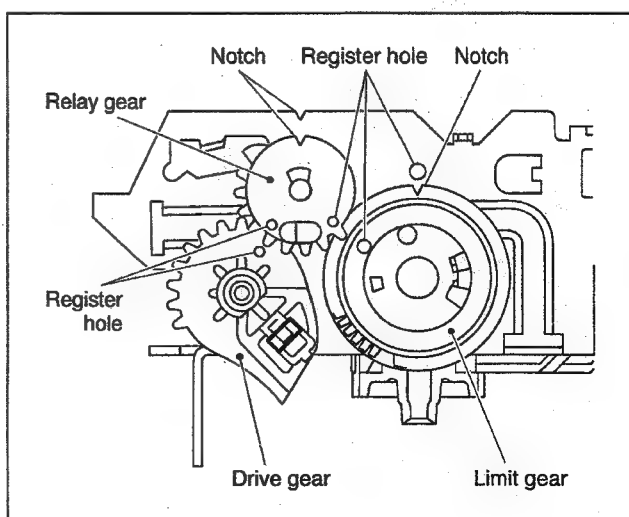


Fig. 2-2-9

## 2.2.4 Pinch Roller Arm Assembly

### 1. How to remove

- (1) Remove the spring from the hook of the press lever.
- (2) Remove the slit washer and remove the pinch roller seat. (See Fig.2-2-10)
- (3) Remove the pinch roller arm assembly by pulling it up.

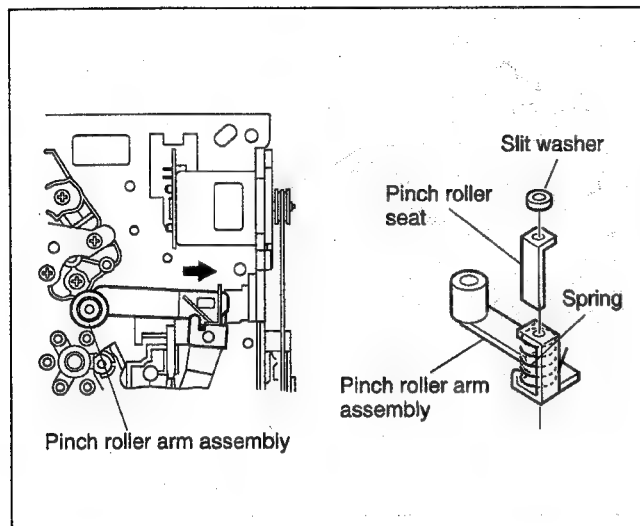


Fig. 2-2-10

## 2.2.5 Guide Arm and Press Lever

### 1. How to remove

- (1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm by pulling it up.
- (2) Remove the press arm by pulling it up. (See Fig.2-2-11)

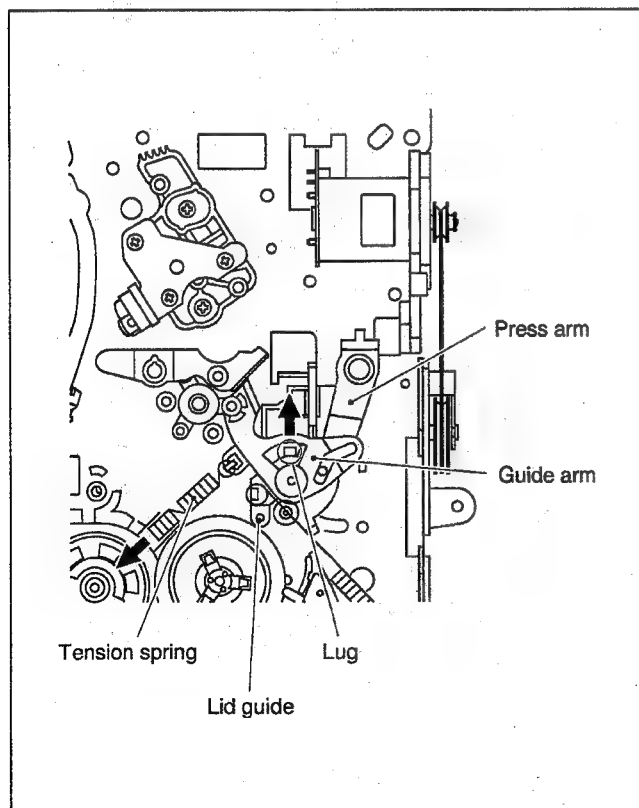


Fig. 2-2-11

## 2.2.6 Audio Control Head

### 1. How to remove

- (1) Remove two screws (A) and remove the audio control head together with the head base.

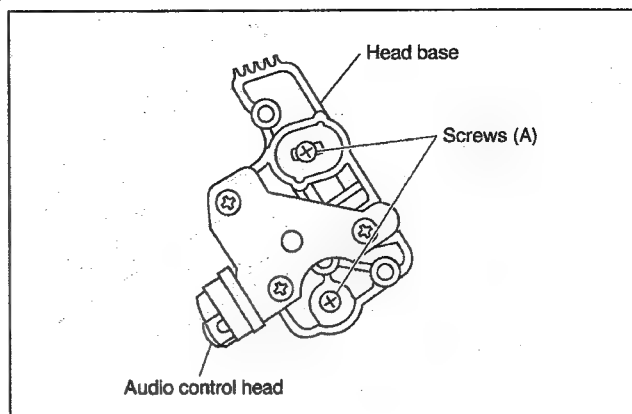


Fig. 2-2-12

- (2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

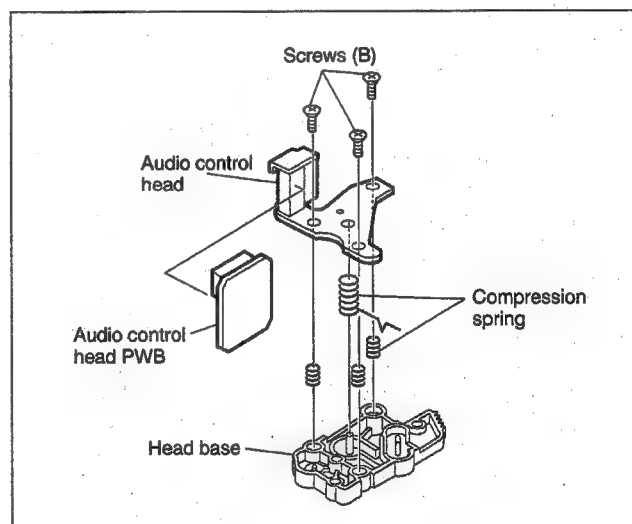


Fig. 2-2-13

### 2. How to install

- (1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-14. Also make sure that the screw center is brought into alignment with the center position of the slot.

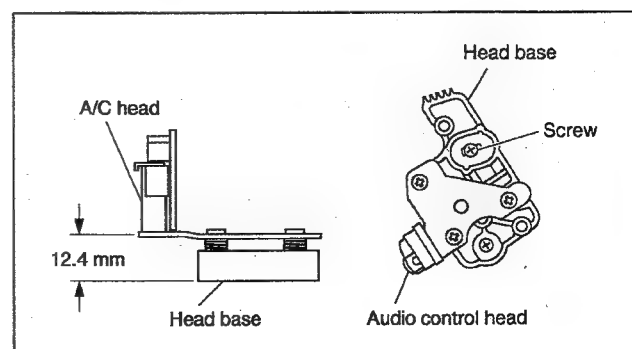


Fig. 2-2-14

## 2.2.7 Loading Motor

### 1. How to remove

- (1) Remove the belt wound around the worm gear.
- (2) Open the two lugs of the motor guide and remove the loading motor, loading motor PWB and motor guide altogether by pulling them up.
- (3) When replacing the motor base, take care with the orientation of the motor (so that the label faces upward).
- (4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-15.

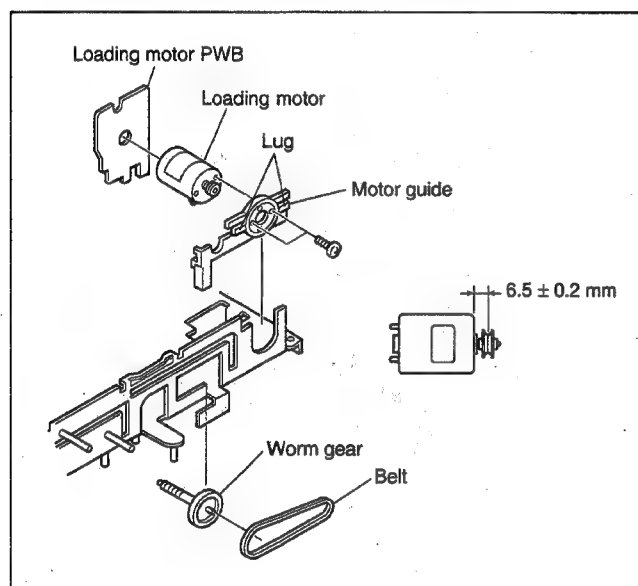


Fig. 2-2-15

## 2.2.8 Capstan Motor

### 1. How to remove

- (1) Remove the belt (capstan) on the main deck back side.
- (2) Remove one screw (A) and remove the pinch roller guide.
- (3) Remove two screws (B) and remove the capstan motor.

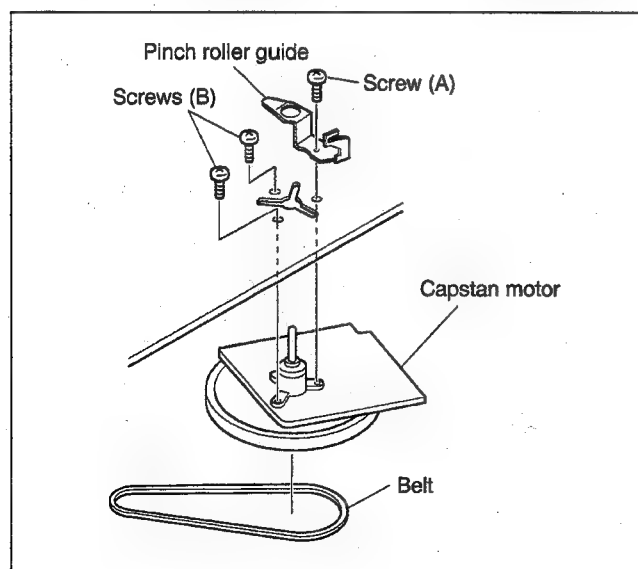


Fig. 2-2-16

### 2. How to install

Please refer to page 53.

## 2.2.9 Pole Base (on the supply or take-up side)

### 1. How to remove

- (1) Remove the UV catcher on the removal side by loosening one screw (A).
- (2) Remove the pole base on the supply side from the main deck by loosening one screw (B) on the main deck back side and sliding the pole base toward the UV catcher.
- (3) As for the pole base on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate (See the "Procedures for Lowering the Cassette holder assembly" on page 25 of 1.3 DISASSEMBLY/ASSEMBLY METHOD). Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing one screw (B).

**NOTE:** After reinstalling the Pole base and the UV catcher, be sure to perform compatibility adjustment.

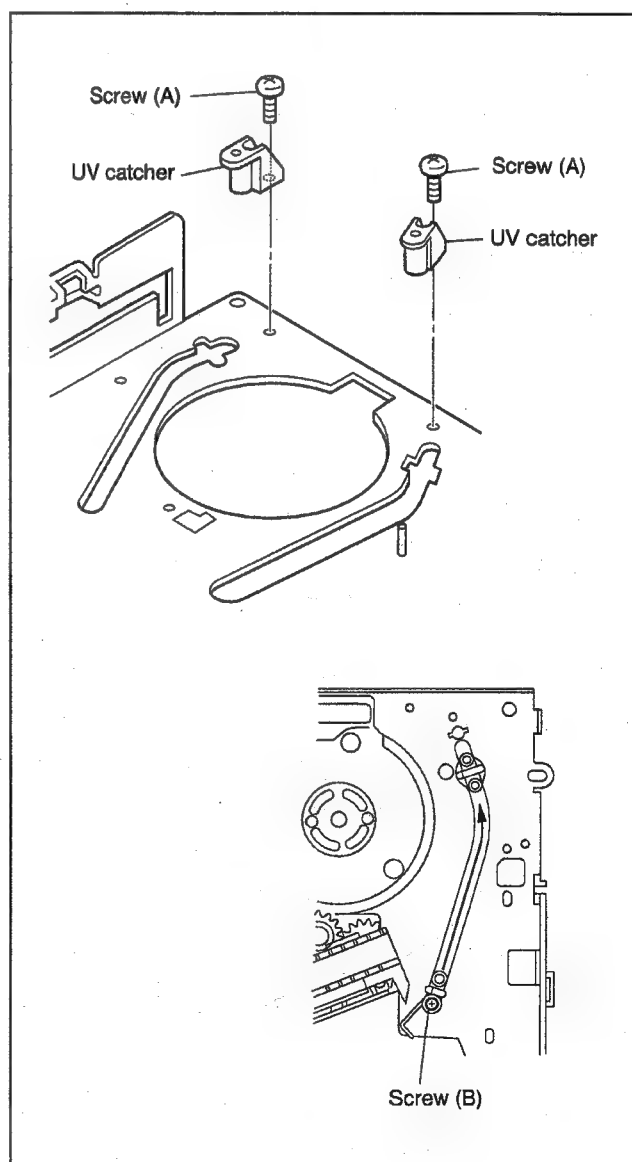


Fig. 2-2-17



### 2.2.10 Rotary Encoder

- (1) Remove one screw (A) and remove the rotary encoder by pulling it up.
- (2) When installing the rotary encoder, bring the register marks into alignment as indicated in Fig.2-2-18.

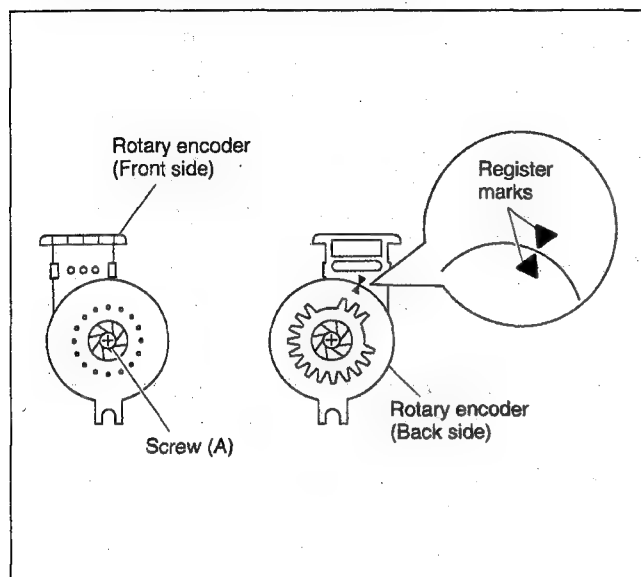


Fig. 2-2-18

### 2.2.11 Clutch Unit

- (1) Remove the belt wound around the capstan motor and the clutch unit.
- (2) Remove the slit washer and remove the clutch unit.

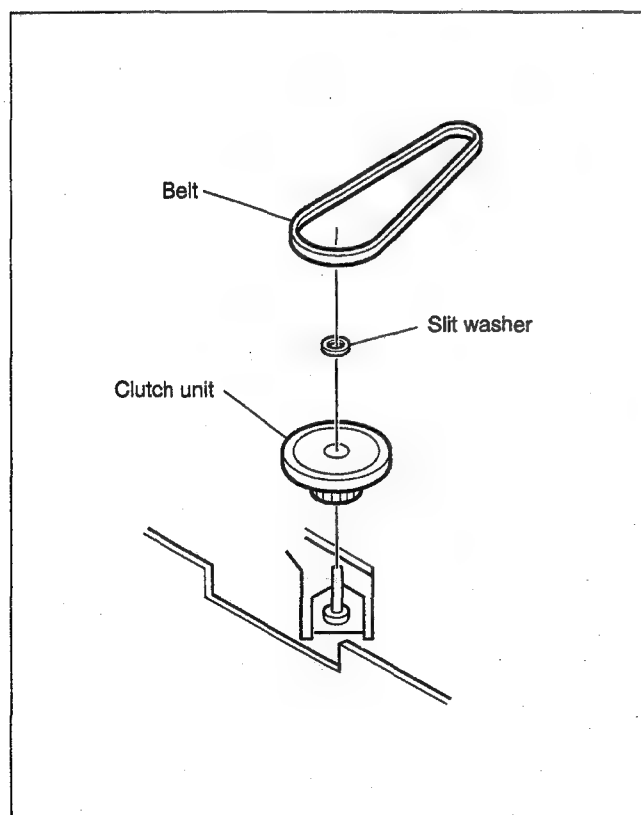


Fig. 2-2-19

### 2.2.12 Change Lever and Direct Gear

- (1) Release two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever.
  - (2) Remove the slit washer retaining the direct gear and remove the latter.
- Take care of the two washers and one spring on and under the direct gear. (See Fig.2-2-20)

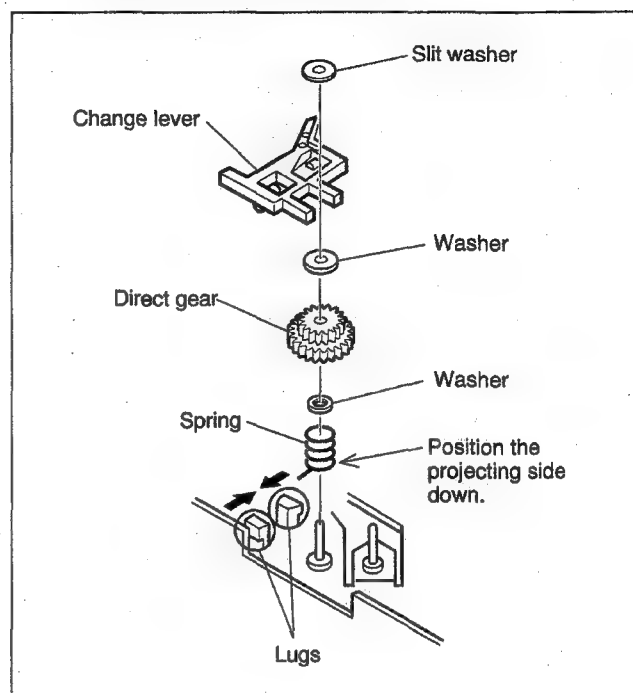


Fig. 2-2-20

### 2.2.13 Link Lever

- (1) Remove the two slit washers.
- (2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the lock member of the control plate.

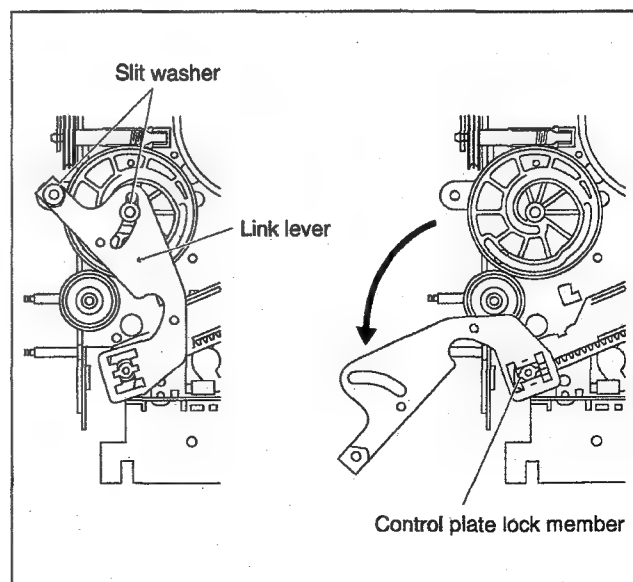


Fig. 2-2-21

### 2.2.14 Cassette Gear, Control Cam and Worm Gear

- (1) Remove the control cam by lifting it.
- (2) Open the two lugs of the cassette gear outward and pull the latter off.
- (3) Remove the belt wound around the worm gear and the loading motor.
- (4) Open the lug of the lid guide outward and remove the worm gear.
- (5) When installing the control cam, make sure that the register hole at the control cam is in alignment with the register hole of the main deck. (See Fig.2-2-22)

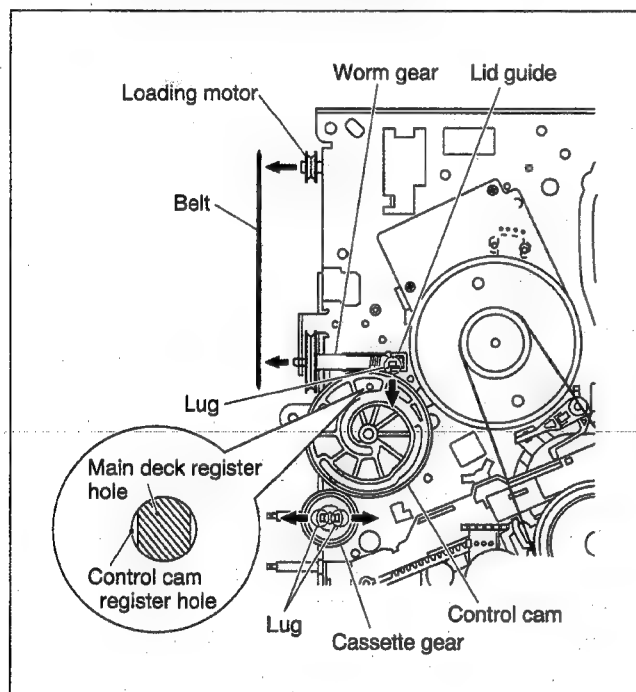


Fig. 2-2-22

### 2.2.15 Control Plate

#### 1. How to remove

- (1) Remove one screw (A) retaining the control plate bracket and remove the latter.
- (2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-23)

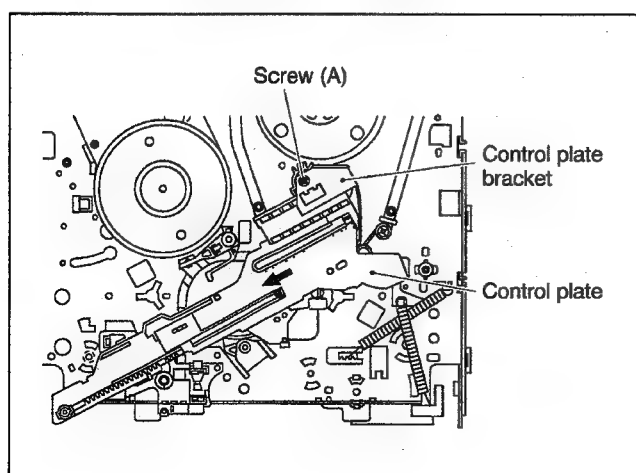


Fig. 2-2-23

#### 2. How to install

- (1) Adjust the position of the idler arm pin as indicated in Fig.2-2-24. (to the left of center of the R section)
- (2) Bring the positioning hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.
- (3) Press-fit the pole base (on the supply side) as indicated by the arrow and install the control plate so that section A of the loading arm gear shaft fits into hole (A) of the control plate, section B of the control plate guide into hole (B), and the control plate comes under section C of the rotary encoder guide and section D of the loading arm (on the take-up side). Then slide the whole control plate in the arrow-indicated direction. (See Fig.2-2-25).
- (4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-25)
- (5) Pull off the hexagonal wrench for positioning.

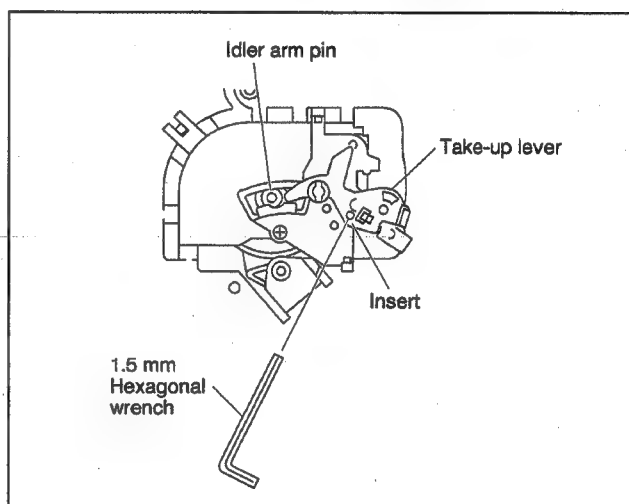


Fig. 2-2-24

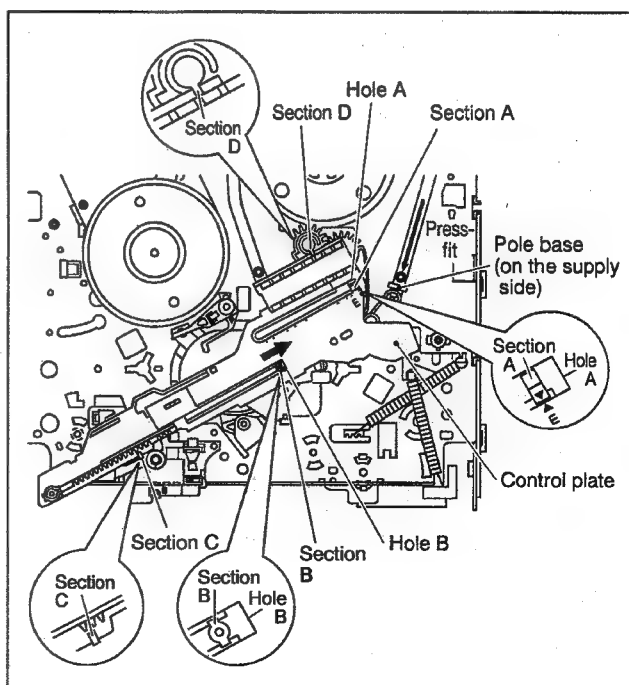


Fig. 2-2-25

## 2.2.16 Loading Arm (on the supply or take-up side) and Loading Arm Gear Shaft

### 1. How to remove

- (1) Remove the loading arm (on the supply side) by loosening screw (A) in Fig.2-2-26.
- (2) Remove screw (B) in Fig.2-2-26 and slide the pole base in the loading direction with the spring held on the pole base (on the take-up side). (See Fig.2-2-26)
- (3) Pull the spring out of the pole base. Turn the loading arm clockwise through about 45 degrees so that the notch of the loading arm is in alignment with the projection of the loading arm gear shaft and lift it.  
Likewise, turn the loading arm counterclockwise through 180 degrees so that the notch is in alignment with the projection and remove the loading arm (on the take-up side). (See Fig.2-2-27)
- (4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove one screw (C) and remove the loading arm gear shaft by sliding it in the arrow-indicated direction.

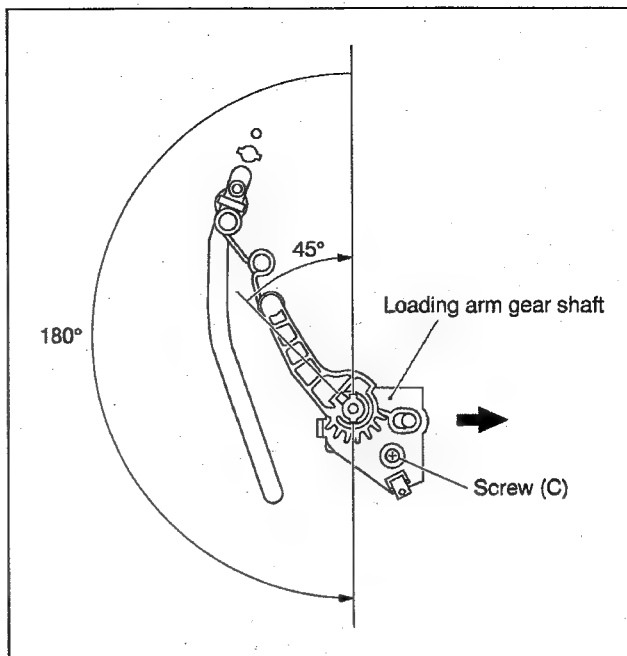


Fig. 2-2-27

### 2. How to install

- (1) Install the loading arm (on the take-up side) as indicated in Fig.2-2-28 and turn it clockwise through 180 degrees so that the loading arm reaches the bottom of the loading arm gear shaft.
- (2) Then turn the loading arm (on the take-up side) counterclockwise through 180 degrees. Hang the spring on the pole base and tighten the screw.
- (3) Install the loading arm (on the supply side) so that the register mark of the loading arm (on the take-up side) is in alignment with the register mark of the loading arm (on the supply side). Then hang the spring on the pole base and tighten the screw. (See Fig.2-2-26).

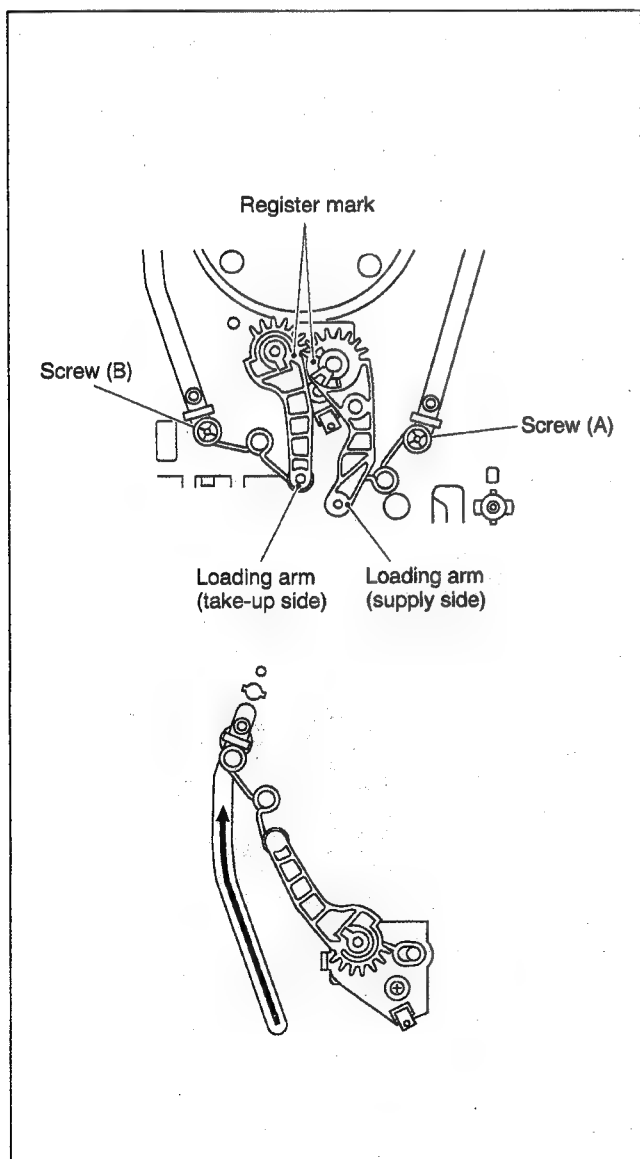


Fig. 2-2-26

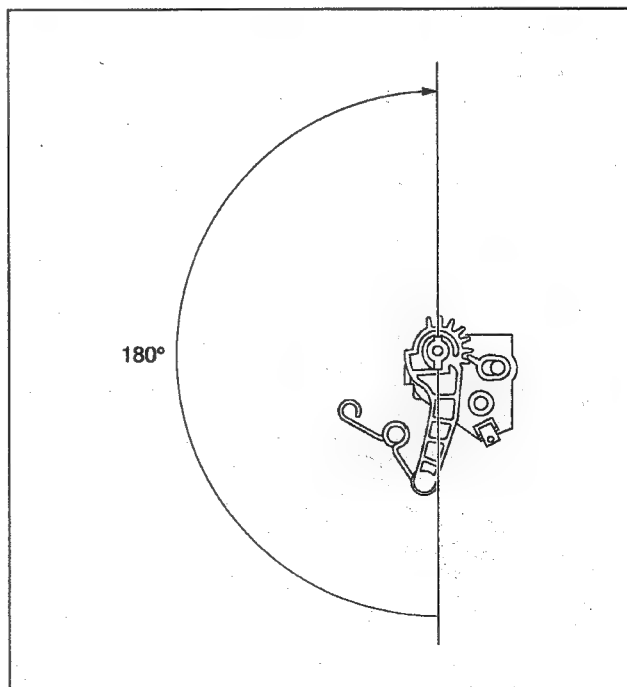


Fig. 2-2-28

### 2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

- (1) Remove the spring of the take-up lever from the main deck.
- (2) Remove one lug of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.
- (3) Remove one screw (A).
- (4) Remove two lugs of the control plate guide from the main deck. Locate the idler arm pin in the center of the R section of the control plate and remove the latter.

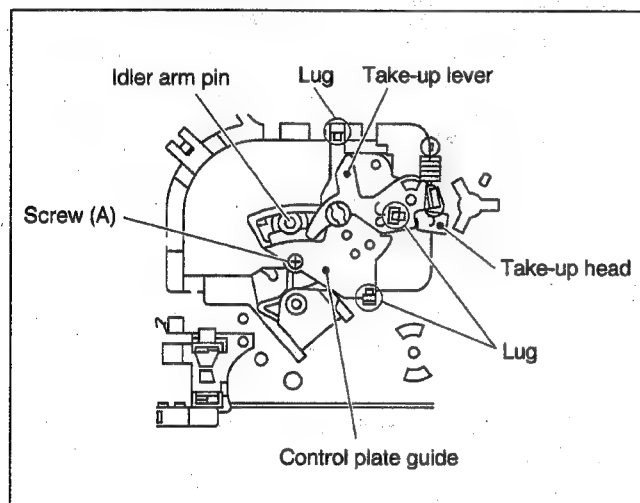


Fig. 2-2-29

### 2.2.18 Capstan Brake

- (1) Move lug A of the capstan brake in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-30)
- (2) Remove lug B of the capstan brake from the main deck and remove the capstan brake.

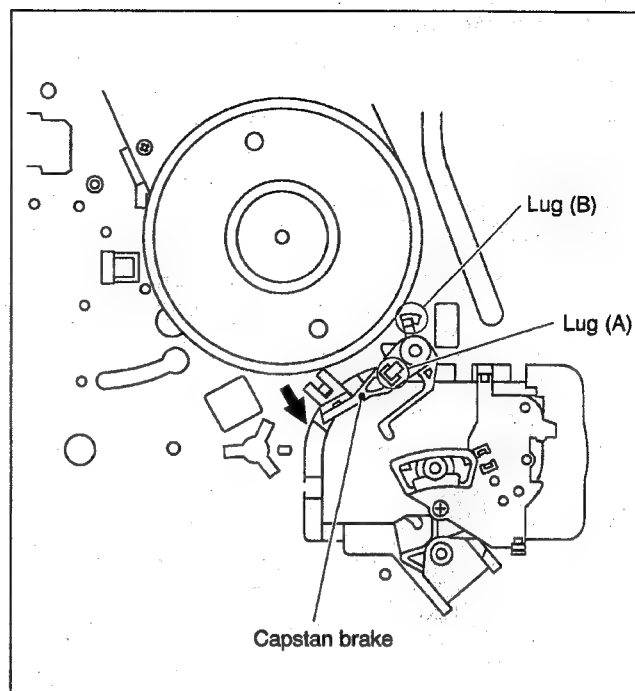


Fig. 2-2-30

### 2.2.19 Drive Gear and Drive Arm

#### 1. How to remove

- (1) Remove the cassette holder assembly. (See 2.2.3 How to remove the cassette holder assembly)
- (2) Pull out the drive gear and remove the drive arm.

#### 2. How to install

- (1) Insert section A of the drive arm into section B of the main deck.
- (2) Insert section ① of drive gear into hole ○ of the drive arm and section ② into hole □. (See Fig. 2-2-31)

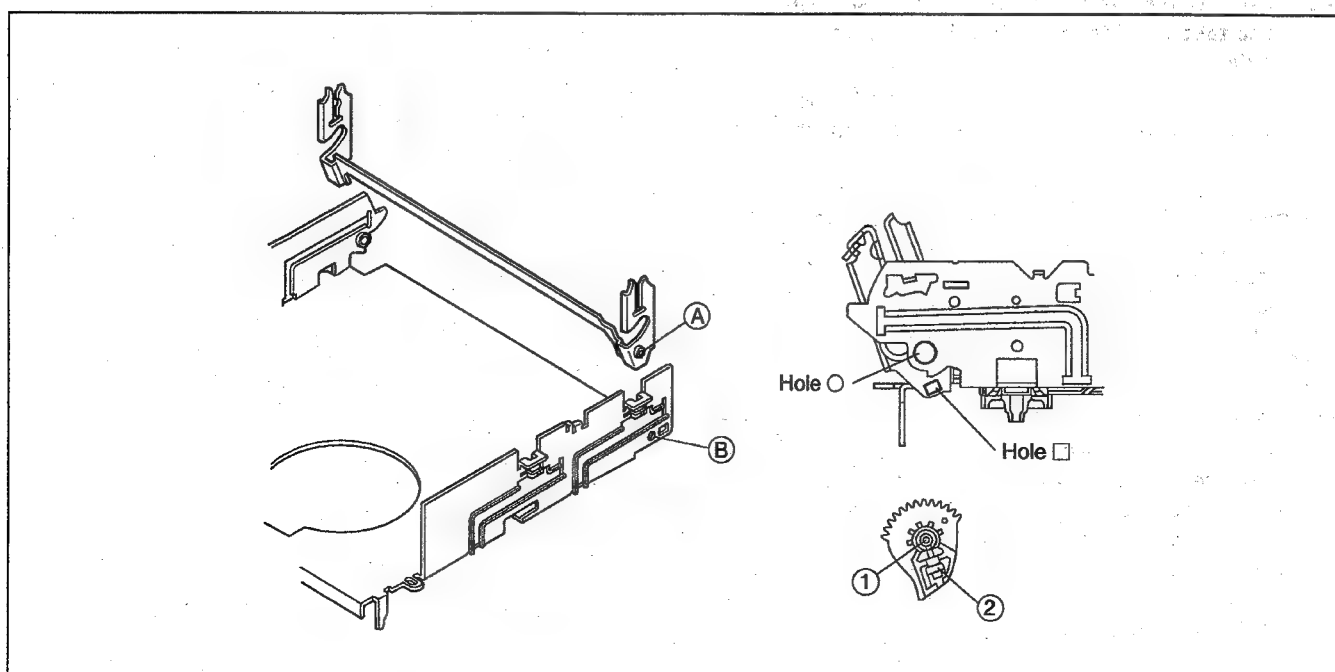


Fig. 2-2-31

### 2.2.20 Sub Brake (on the take-up side)

- (1) Remove the spring attached to the lid guide and sub brake.
- (2) Bring lug (A) of the sub brake into alignment with the notch of the main deck.
- (3) Remove lugs (B) and (C) of the sub brake from the main deck and remove the sub brake.

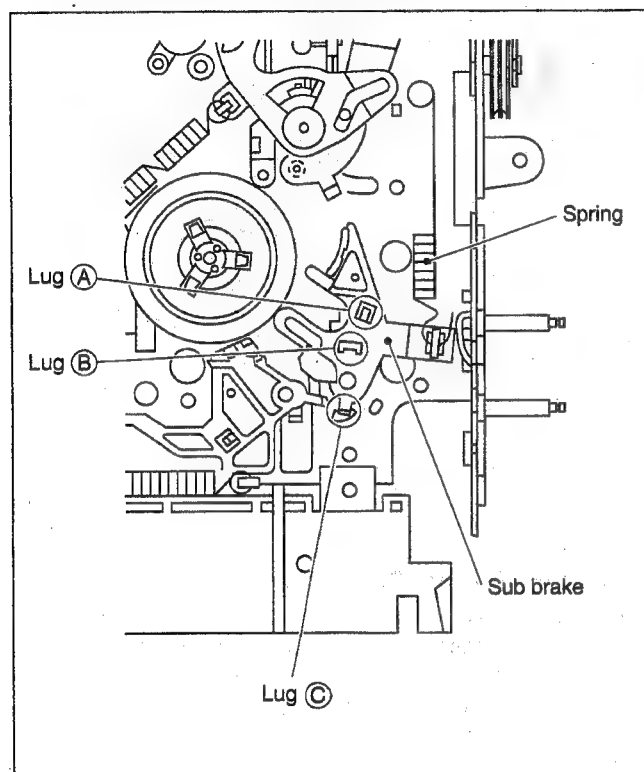


Fig. 2-2-32

### 2.2.21 Main Brake (on the take-up side), Reel Disk (on the take-up side) and Main Brake (on the supply side)

- (1) Move the main brake (on the take-up side) in the arrow-indicated direction and remove the reel disk (on the take-up side).
- (2) Remove the spring attached to the main brake.
- (3) Remove lug (A) of the main brake (on the take-up side) and pull out lug (B) after bringing it into alignment with the main deck notch.
- (4) Remove lugs (C) and (D) of the main brake (on the supply side) from the main deck and pull them off. (See Fig. 2-2-33)

**Note:** If the main brake is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it. After the adjustment pin has been removed or the main brake or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake torque. See page 52 for the detailed adjustment procedures.

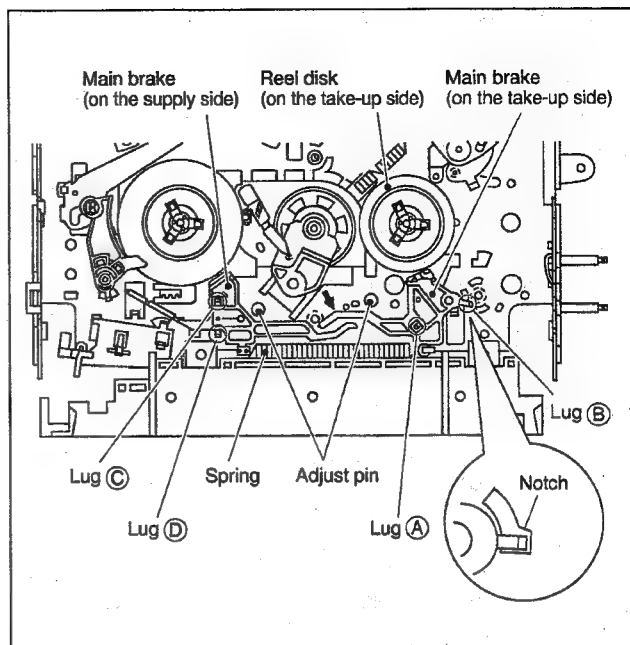


Fig. 2-2-33

### 2.2.22 Tension Brake, Reel Disk (on the supply side) and Tension Arm

- (1) Remove the three lugs of the tension brake from the main deck and pull them off.
- (2) Remove the reel disk (on the supply side) by loosening in the arrow-indicated direction the main brake (on the supply side).
- (3) Remove the tension spring on the main deck back side and remove the lugs of the tension arm bearing to pull up and remove the tension arm. (See Fig. 2-2-34)

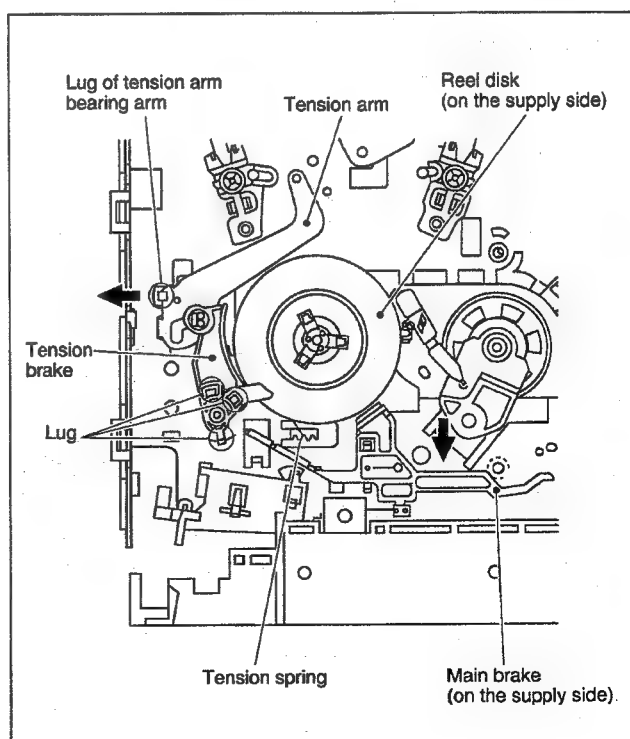


Fig. 2-2-34

### 2.2.23 Idler Lever, Idler Arm and Reel Shaft

- (1) Remove one lug of the idler lever from the main deck and remove the hook fitted in the idler arm hole by lifting it.
- (2) Remove the slit washer and pull out the idler arm.
- (3) Turn the reel shaft counterclockwise through 60 degrees and remove it. (See Fig.2-2-35)

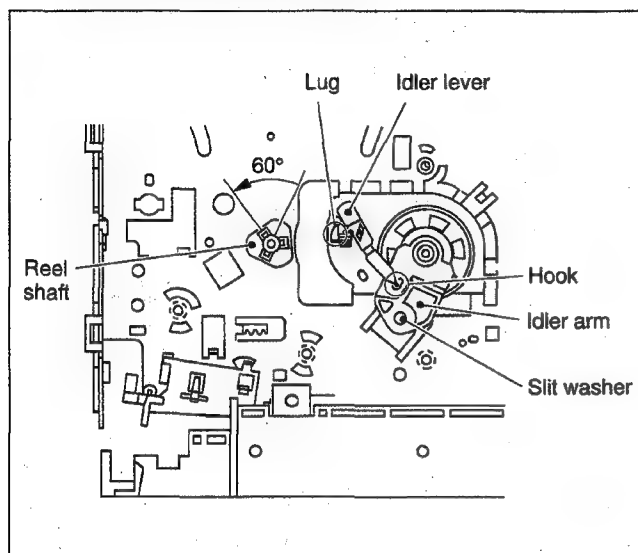


Fig. 2-2-35

### 2.2.24 Stator Assembly

- (1) Remove two screws (A).
- (2) Remove the stator assembly by lifting in the arrow-indicated direction (Take care that the brush spring does not jump out).
- (3) Remove the flat cable.
- (4) After installation, be sure to perform the 3.2.1 PB switching point adjustment according to the electrical adjustment procedure.

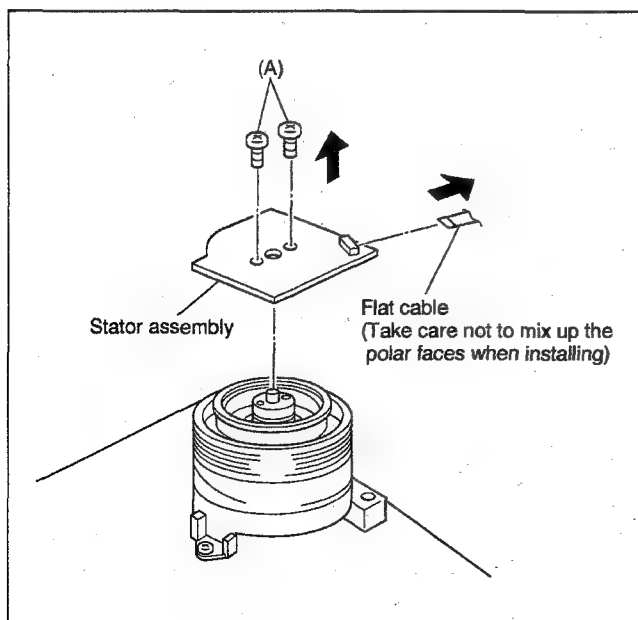


Fig. 2-2-36

### 2.2.25 Rotor Assembly

- (1) Remove the stator assembly.
- (2) Remove the two screws (B) and remove the rotor assembly.

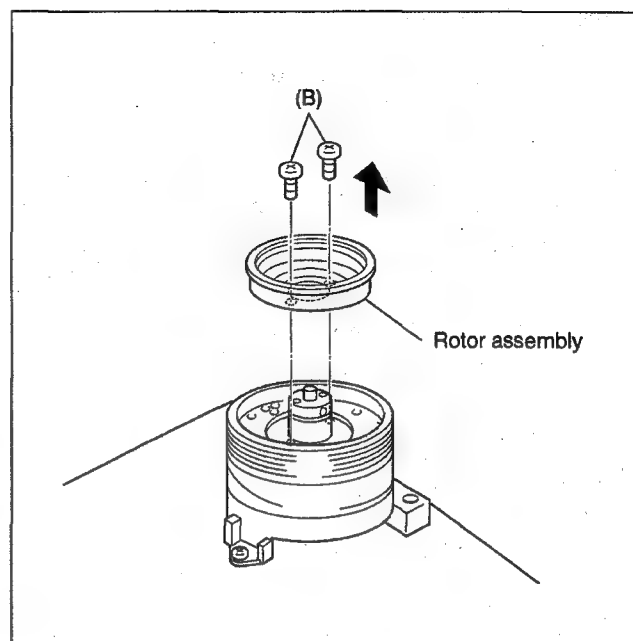


Fig. 2-2-37

**Note:** When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.

- (3) Match the phases of the upper drum and the rotor assembly as indicated in Fig.2-2-38.
- (4) Place the upper drum hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-38)

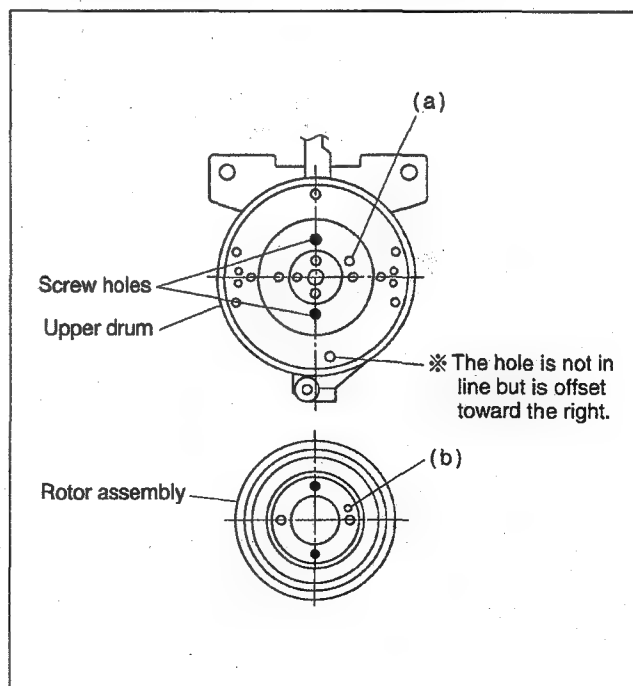


Fig. 2-2-38

## 2.2.26 Upper Drum Assembly

### 1. How to remove

- (1) Remove the stator assembly and rotor assembly. (See Fig. 2-2-36 and 2-2-37)
- (2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
- (3) Remove the upper drum assembly and remove the washer using tweezers.

**Note:** When replacement is required, control the up-down movement of the brush. Never apply grease.

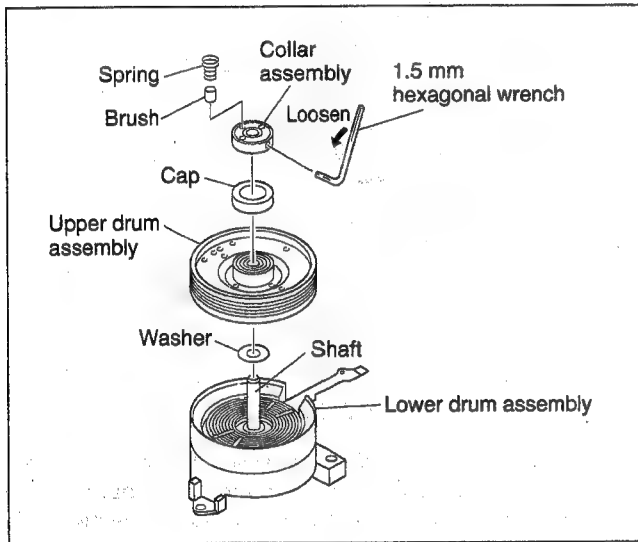


Fig. 2-2-39 Upper drum assembly-1

### 2. How to install

- (1) Clean coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-40).
- (2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-39)

**Note:** When replacing the upper drum assembly, replace it together with the washer.

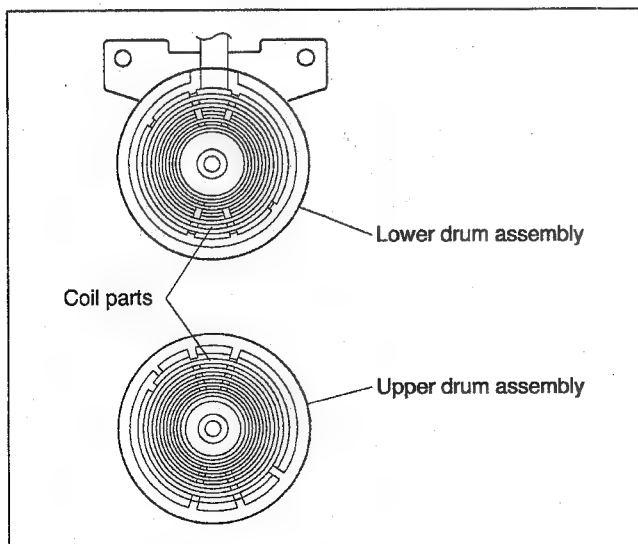


Fig. 2-2-40

- (3) Position the collar assembly as indicated in Fig.2-41 while controlling its up-down movement.

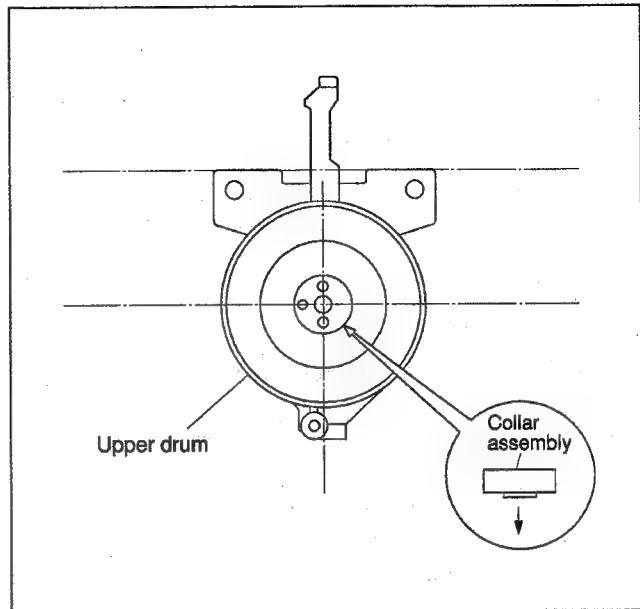


Fig. 2-2-41

- (4) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

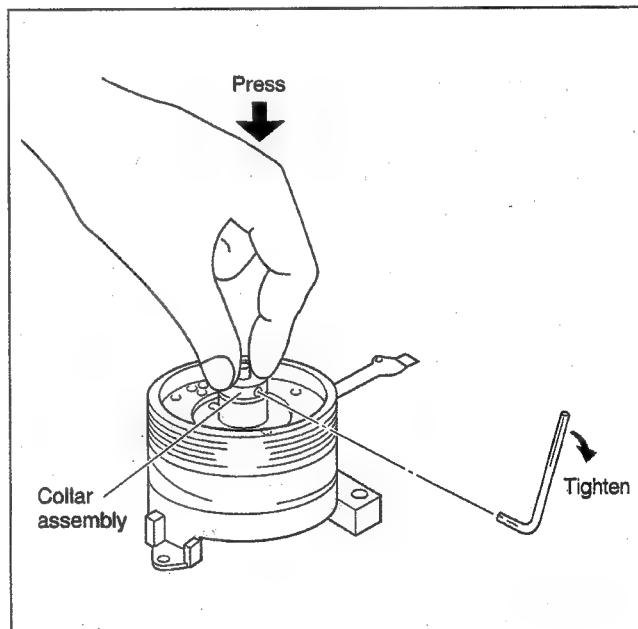


Fig. 2-2-42

- (5) After installation, gently turn the upper drum with your hand to make sure that it turns normally.
- (6) Install the rotor assembly and stator assembly according to Fig 2-2-36 and 2-2-38.
- (7) When installation is complete, clean the upper drum assembly and lower the drum assembly and carry out the following adjustments.
  - PB switching point adjustment
  - Slow tracking adjustment
  - Compatibility adjustment (Be sure to check for compatibility for the EP mode.)

## 2.3 MAJOR PARTS INSTALLATION (PHASE MATCHING BETWEEN MECHANICAL PARTS)

### 2.3.1 Before Assembly of the Parts

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm assembly, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

Perform the installation of major parts (including phase matching) in the mechanism assembling mode as in the previous section.

### 2.3.2 Loading Arm Assembly (on the Supply or Take-up Side)

- (1) Return the pole base assembly to the foremost position in the unloading direction.
- (2) Install the loading arm assembly so that the register mark on the gear of the supply side loading arm is in alignment with the one on the take-up side loading arm as indicated in Fig. 2-3-1.

See 2.2.16 "2. How to install" of the foregoing section for details of installation.

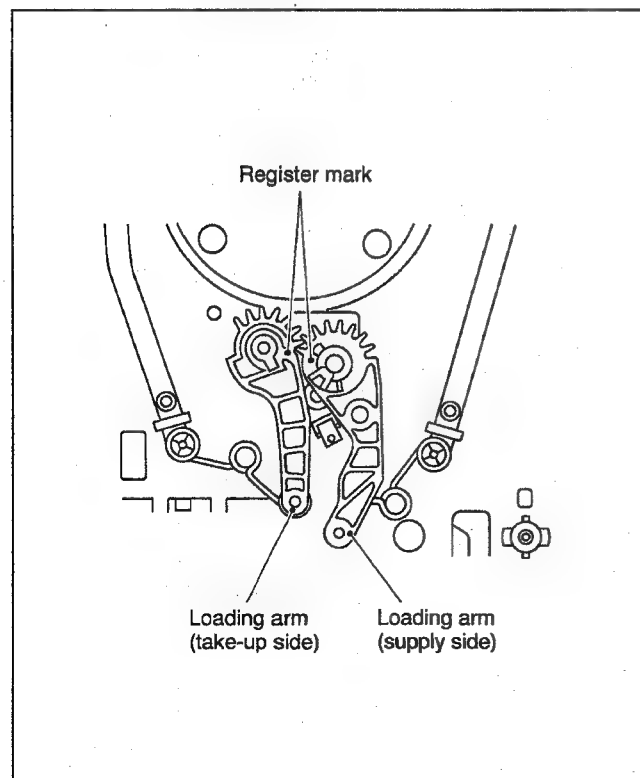


Fig. 2-3-1

### 2.3.3 Control Plate

- (1) With register marks on the both loading arm assemblies in alignment, install the control plate so that the mark ▼ on the loading arm gear shaft is in alignment with mark E of the control plate. (See Fig.2-3-2)

See 2.2.15 "2. How to install" of the foregoing section for details of installation.

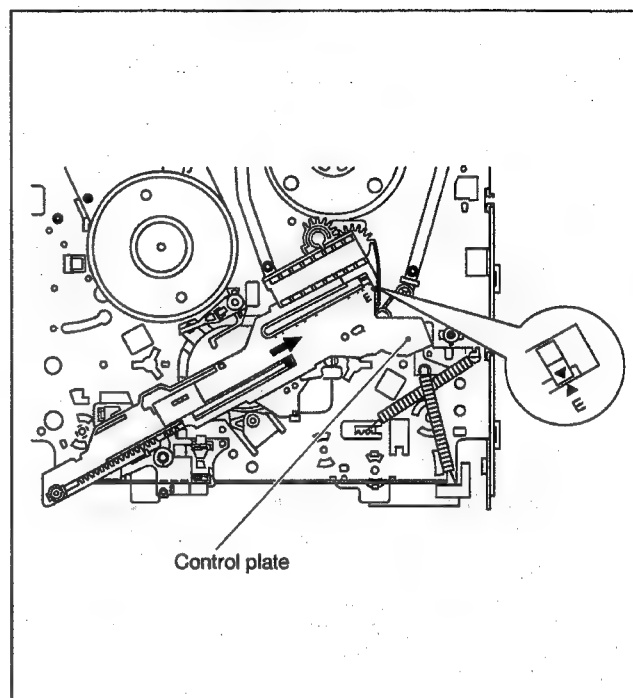


Fig. 2-3-2

### 2.3.4 Rotary Encoder

- (1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the register marks on the rotary encoder into alignment as indicated in Fig.2-3-3.
- (2) Turn over the rotary encoder with its register marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.
- (3) Tighten the screw (A) to complete the installation.



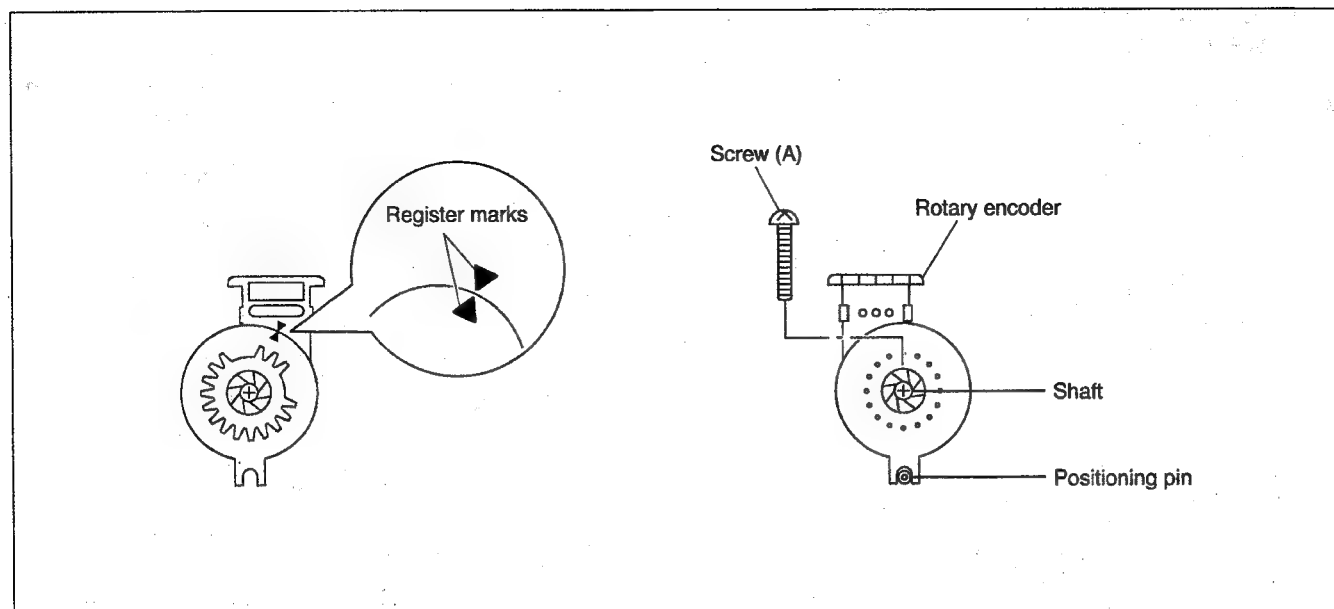


Fig. 2-3-3

### 2.3.5 Control Cam, Cassette Gear and Link Lever

- (1) Install the control cam as indicated in Fig.2-3-4 making sure of the front and back side alignment.  
Note here that the register hole of the control cam is in alignment with and allows passage through the register hole of the main deck. Perform fine-adjustment by turning the worm gear.
- (2) Install the cassette gear by pushing it until it is locked with a clicking sound. (See Fig.2-3-4)
- (3) Insert section (A) of the link lever into section (B) of the control plate as shown in Fig.2-3-5.

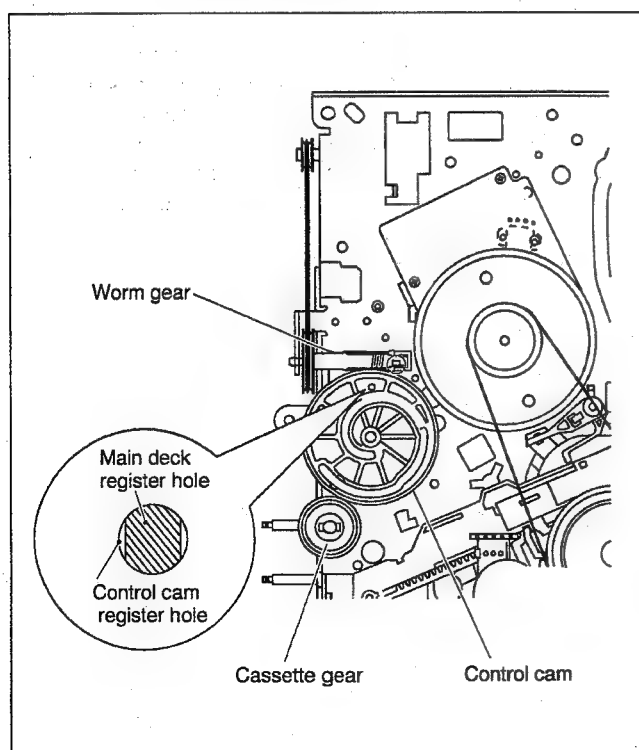


Fig. 2-3-4

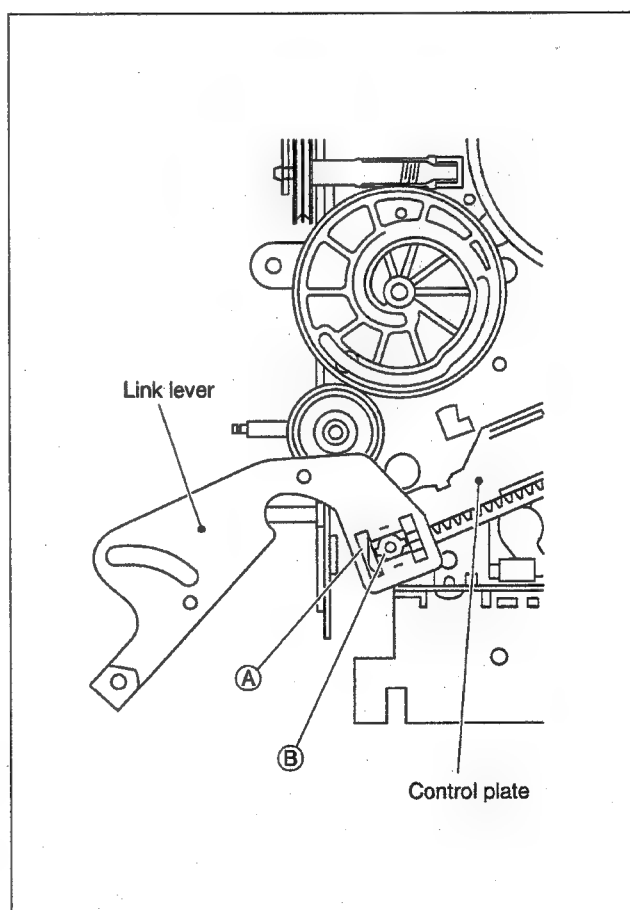


Fig. 2-3-5

- (4) Turn the link lever clockwise and mount it on the control cam center shaft (A) and the control cam left-side shaft (B). (See Fig.2-3-6).
- (5) Fasten the slit washers at two points (A) and (B).

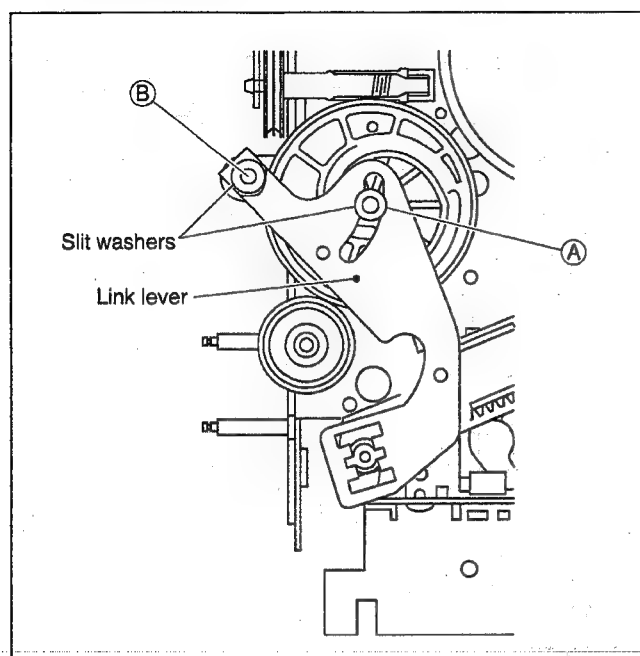


Fig. 2-3-6

### 2.3.6 Relay Gear, Limit Gear and Drive Gear

- (1) Install the limit gear so that the notch at its outer circumference is in alignment with the register hole of the main deck. (See Fig.2-3-7)
- (2) Install so that the notch at the outer circumference of the relay gear is in alignment with the notch of the main deck, and at the same time, that the hole A of the relay gear is in alignment with hole A of the limit gear and hole B of the relay gear with hole B of the drive gear. (See Fig.2-3-7)

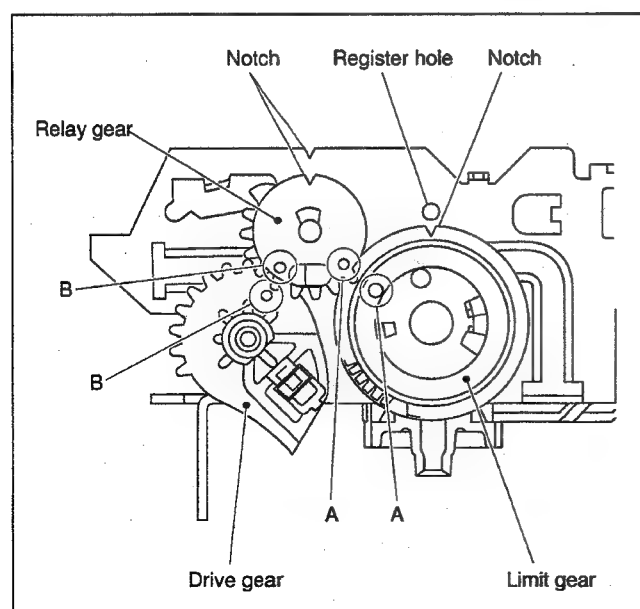


Fig. 2-3-7

## 2.4 COMPATIBILITY ADJUSTMENT

- Notes:**
- Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.
  - To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.

### 2.4.1 Checking/Adjustment of FM Waveform Linearity

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
- (2) Playing the alignment tape MHP, observe the FM waveform.
- (3) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)
- (4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (Fig.2-4-1)
- (5) Slightly loosen the set screw under the pole base assembly with a 1.25 mm hexagonal wrench (Take care not to loosen too much). (Fig.2-4-2)
- (6) Reduce the FM waveform while pressing the channel buttons (+, -) during playback. If a drop in level is found on the left side as shown in Fig.2-4-3, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear. If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (Fig.2-4-3)
- (7) Then play MHP-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
- (8) After adjustment, tighten the set screw under the pole base assembly. (Take care not to tighten too much)
- (9) After tightening the set screw, play the alignment tape MHP and MHP-L again to make sure that the FM waveform has correct variation.

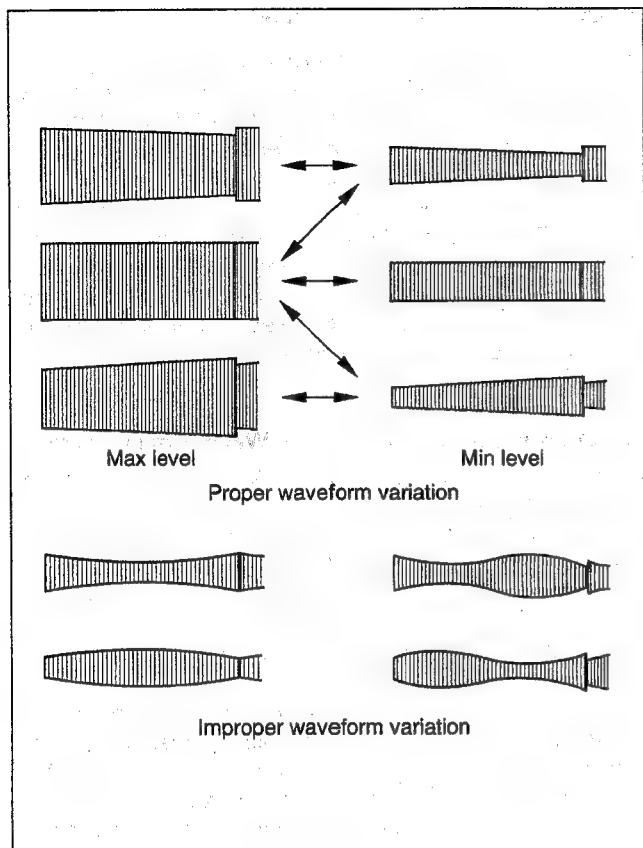


Fig. 2-4-1

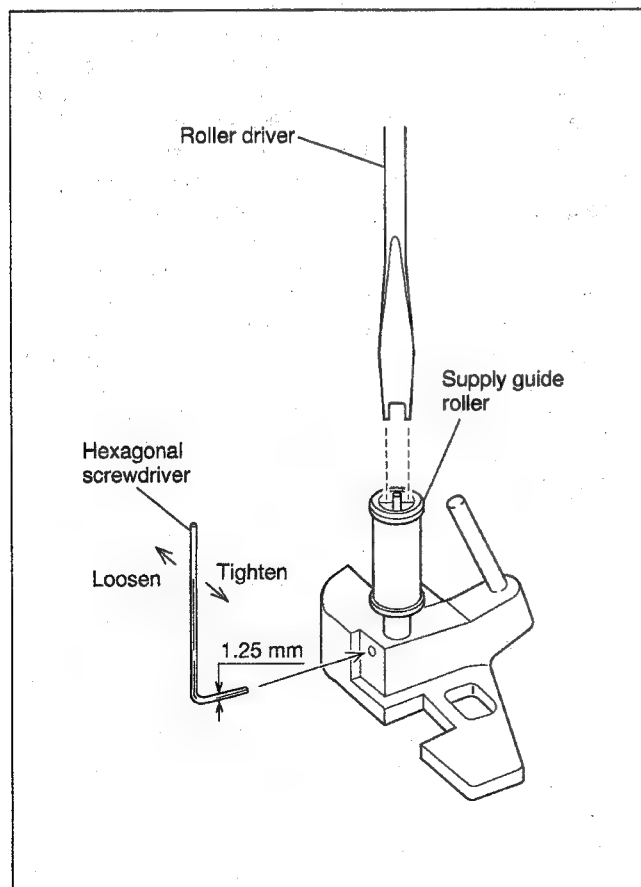


Fig. 2-4-2

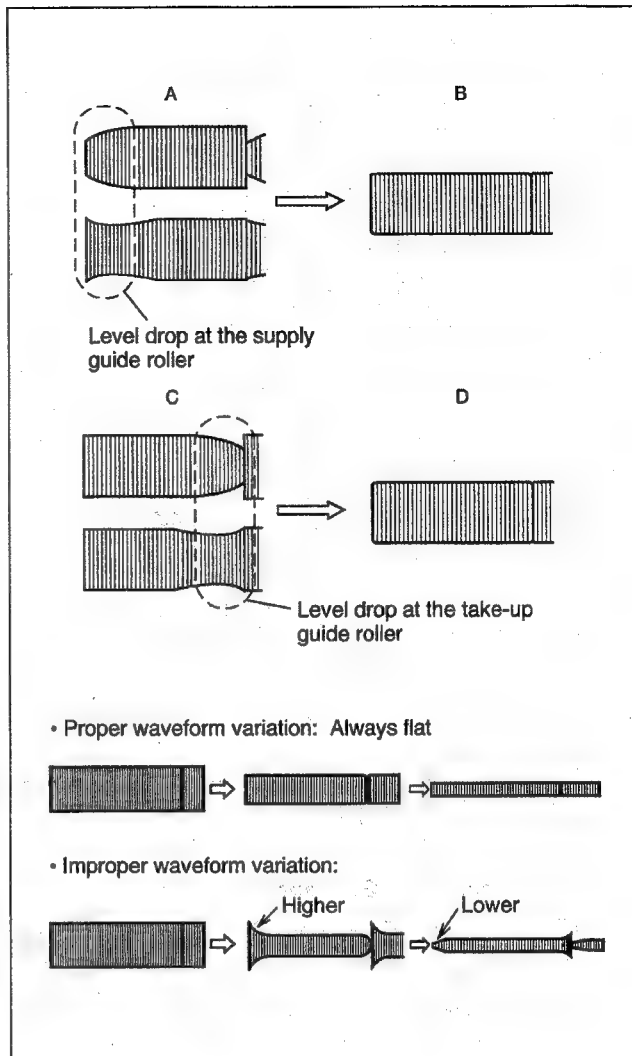


Fig. 2-4-3

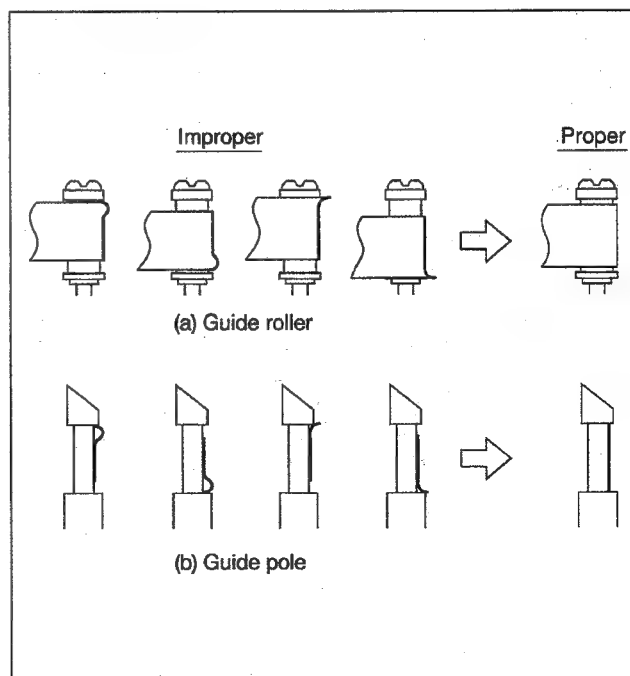


Fig. 2-4-4

### 2.4.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

**Note:** Set a temporary level of the height of the A/C head in advance to make the adjustment easier. (See Fig.2-2-14)

- (1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL P) of the main board and observe the waveforms on both channels in the ALT mode.
- (2) Play the alignment tape MHP and adjust it by turning screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. Screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

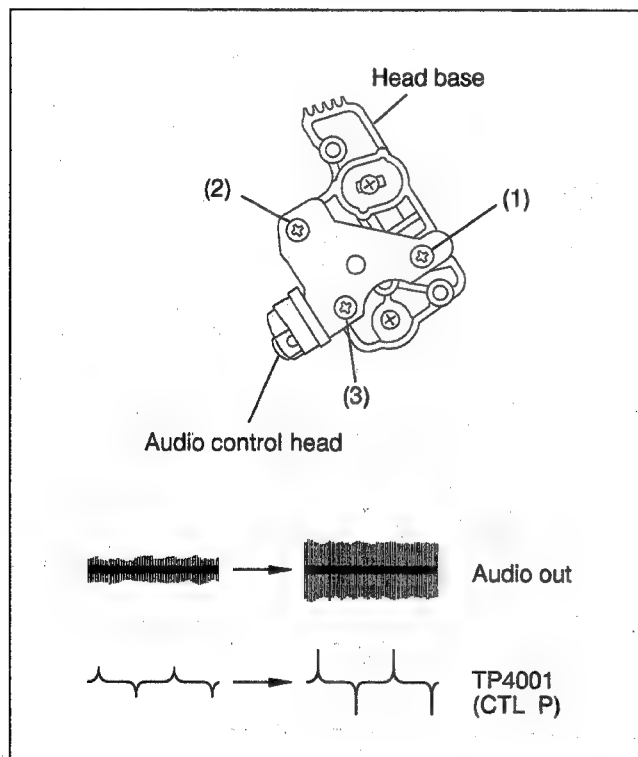


Fig. 2-4-5

### 2.4.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
- (2) Play the alignment tape MHP and observe the FM waveforms.
- (3) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)
- (4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-4-6.
- (5) Turn the A/C head position and first move the audio control head fully up to the capstan head. Then gradually return the audio control head toward the drum and stop it where the FM waveform reaches its maximum for the first time. Then tighten screw (4) temporarily.

- (6) Then play the alignment tape MHP-L.
- (7) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings the tracking to the center.)
- (8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
- (9) If it is not at maximum, loosen the temporarily tightened screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten screws (4) and (5).

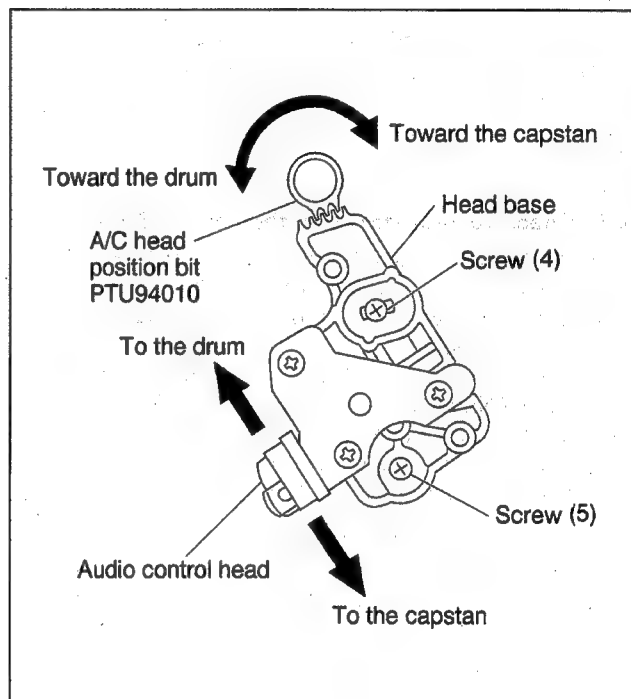


Fig. 2-4-6

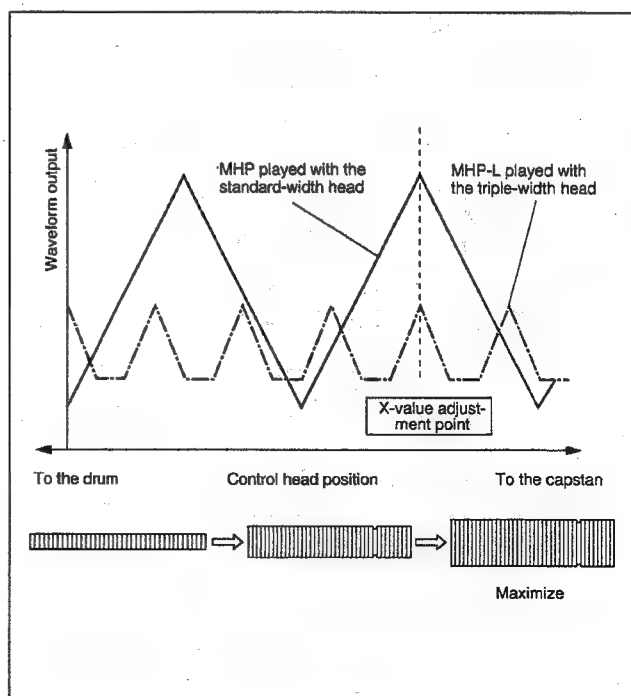


Fig. 2-4-7

#### 2.4.4 EP mode Tracking preset

**Note:** Set the remote control cable of the video recorder to A mode.

(The unit set in B mode does not accept the remote control cable of the presetting unit.)

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
- (2) Playing the alignment tape MHP-L and observing the FM waveform, make sure that the auto tracking operation is complete.
- (3) Press the button "D" of the presetting unit twice.
- (4) Make sure that the MHP-L is not ejected.
- (5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

#### 2.4.5 Checking/Adjustment of the Tension Pole

- (1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 29 - 46 g-cm.
- (2) If the indicated value is outside this range, carry out the following adjustment steps.
  - 1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE).
  - 2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-4-8).

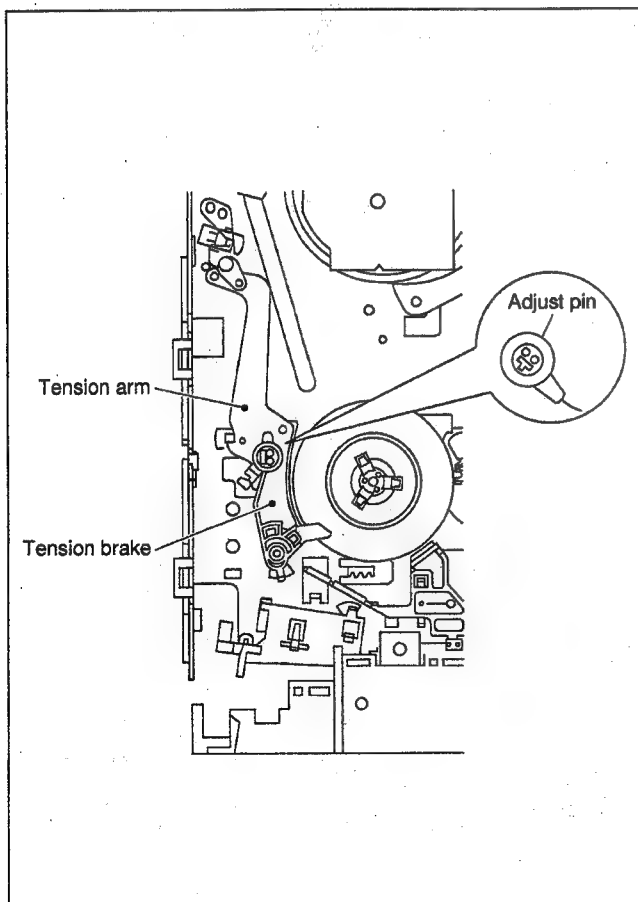


Fig. 2-4-8

#### 2.4.6 Adjustment of the Tension Stud

- (1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck as indicated in Fig.2-4-9.

**Note:** Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.

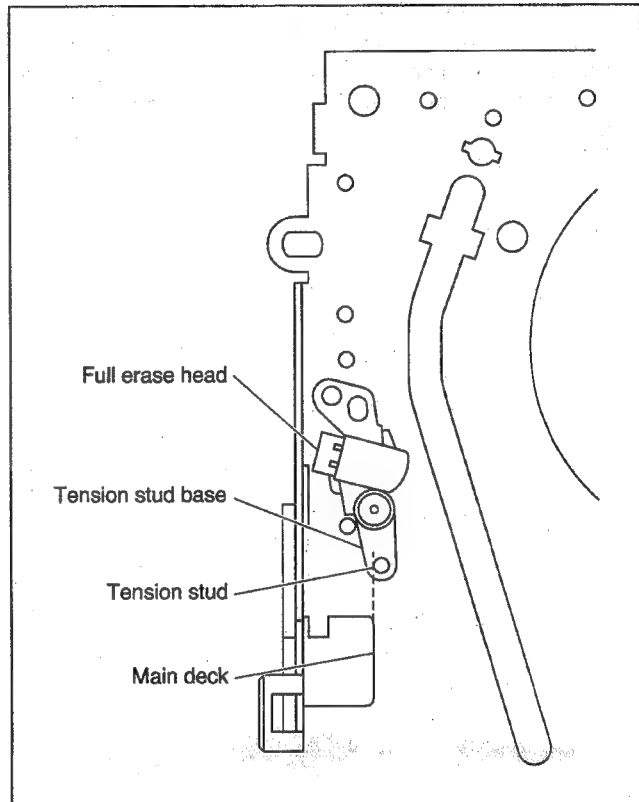


Fig. 2-4-9

#### 2.4.7 Main Brake Torque Adjustment

**Note:** Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake or the reel base on the supply or take-up side have been replaced, removed or attached.

- (1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
- (2) Insert a torque gauge (PUJ48075-2) into the reel base on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel base starts to slip.
- (3) Make sure that the main brake torque values on the supply and take-up sides are both between  $23.5 - 78.4 \times 10^{-3} \text{ N}\cdot\text{m}$  (240 - 800 gf-cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.

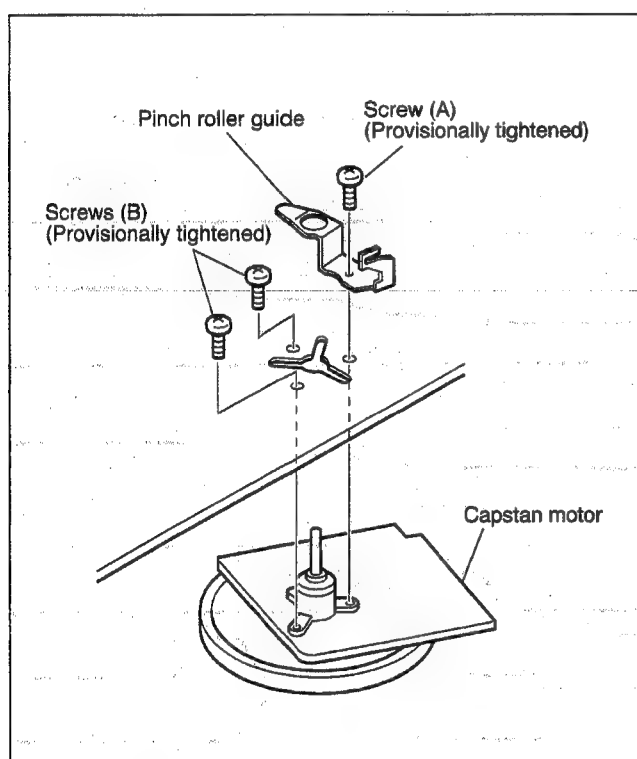
If an adjustment by using the adjustment pin is not possible, replace the main brake.

## How to Mount the Capstan Motor (Centering the Mounting Position)

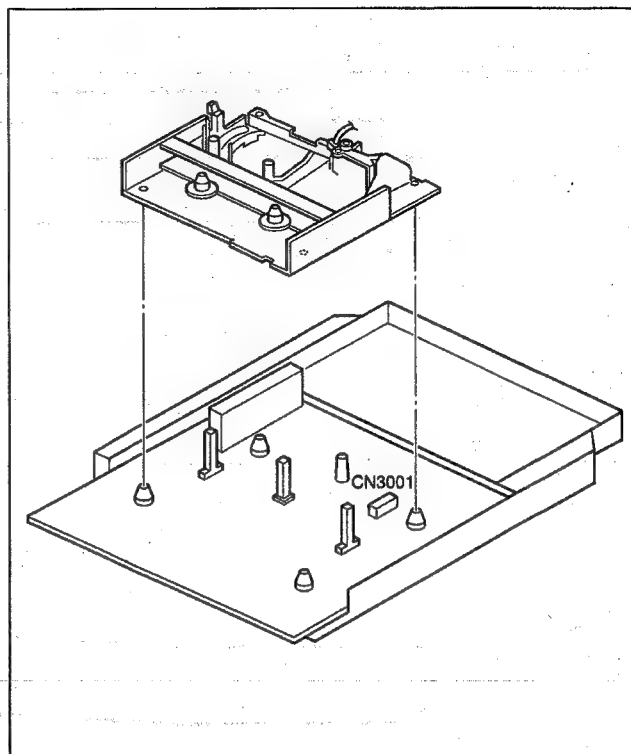
When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power break-down because of current over - load. Install the capstan motor while following the procedure given below.

(The capstan motor is centrally located when the unit is shipped from the factory.)

1. Provisionally tighten one screw (A) together the pinch roller guide and the two screws (B) securing the capstan motor.



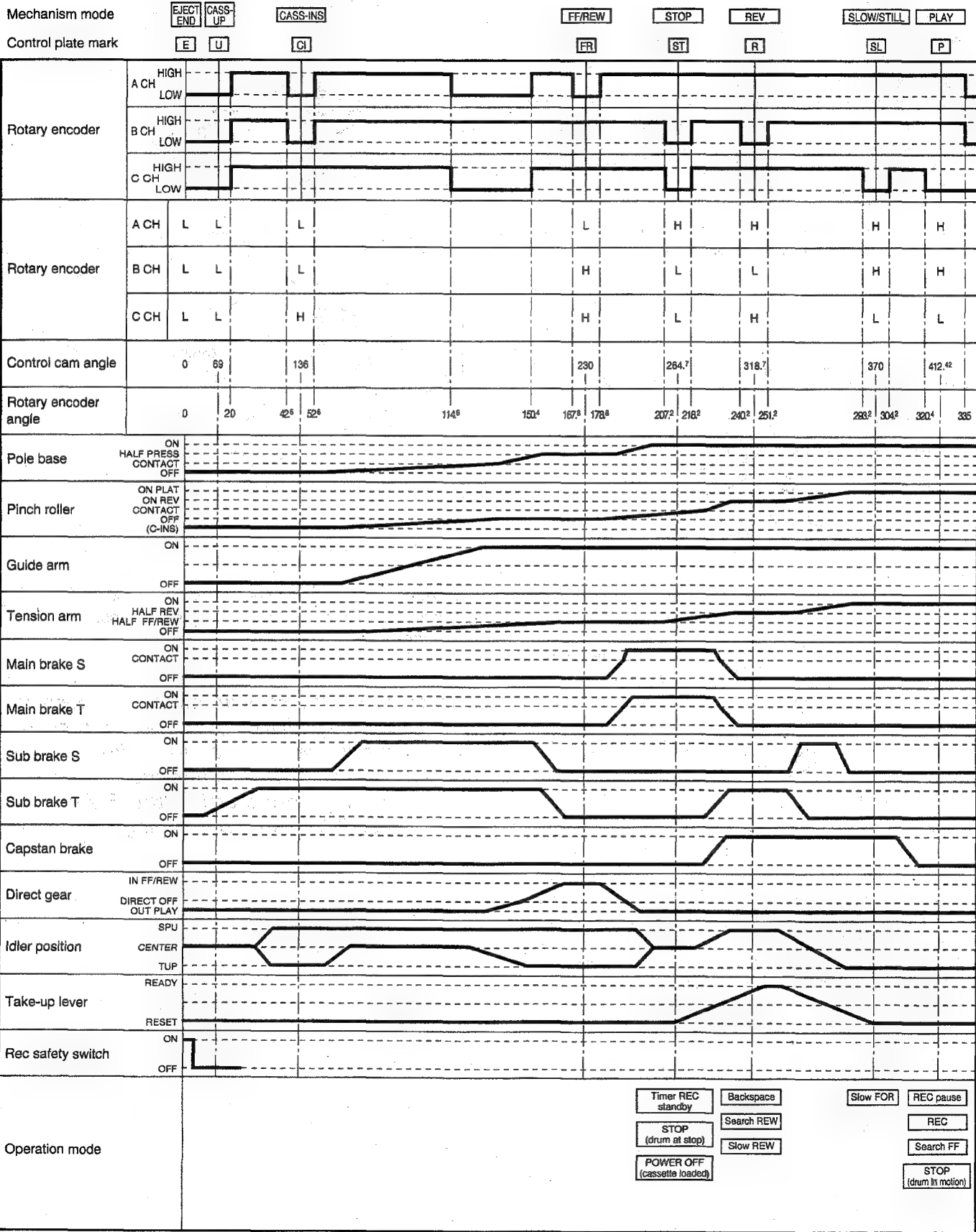
2. Install the mechanism to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism)  
Make sure that all the connectors for the mechanism and the Main board are correctly installed.



3. Securely tighten the three screws (A), especially making sure that the connector CN3001 of the capstan motor is correctly mounted.

**Note:** When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).

Mechanism Timing Chart



## SECTION 2 ELECTRICAL ADJUSTMENT

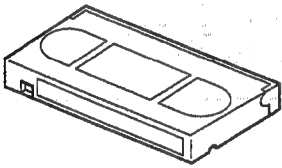
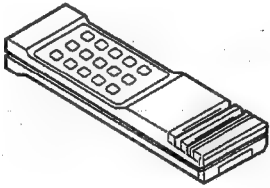
### 3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

#### 3.1.1 Required test equipment

- ① Color television or monitor
- ② Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- ③ Signal generator: NTSC color bar, stairstep
- ④ Recording tape
- ⑤ Digit-key remote controller(provided)

#### 3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHP	Presetting unit PTU94008
	

### 3.1.3 Color bar signal,color bar pattern

#### ● Color bar signal

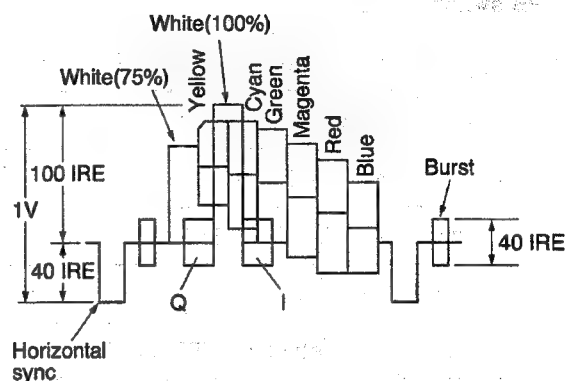


Fig. 3-1-1 Color bar signal waveform

#### ● Color bar pattern

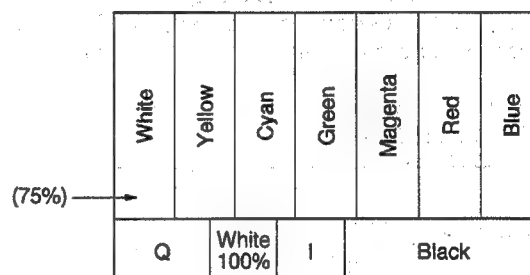


Fig. 3-1-2 Color bar pattern

#### Note:

Be sure to remove R3063 (MAIN PWB ASS'Y) when replacing the system controller IC (MAIN PWB ASS'Y IC3001) and the EEPROM (MAIN PWB ASS'Y IC3004).



### 3.2 SERVO CIRCUIT

**Notes:** • Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.  
• Set VCR to the mode A by remote controller.

#### 3.2.1 PB switching point

Signal	• Alignment tape [MHP], Stairstep
Mode	• PB
Equipment	• Oscilloscope
Measurement point	• VIDEO OUT TERMINAL
Trigger slope (→)	• TP111(DRUM FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• $6.5 \pm 0.5H$

- (1) Connect an oscilloscope to VIDEO OUT TERMINAL and external trigger from TP111 (negative slope).
- (2) Playback the stairstep signal of the alignment tape.
- (3) Press the "O" button of the presetting unit.  
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
- (4) Playback the alignment tape again, confirm the switching point. (See Fig.3-2-2.)

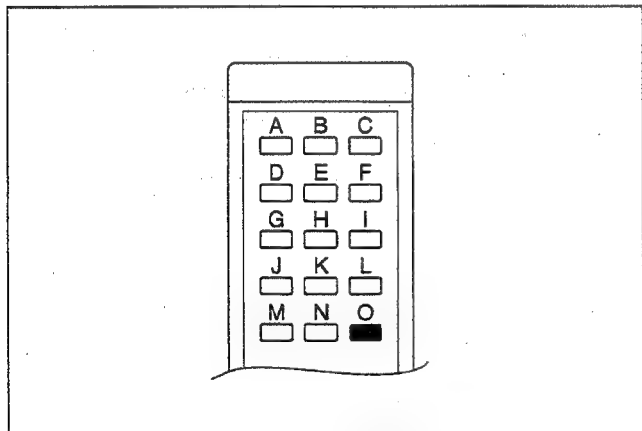


Fig. 3-2-1 Presetting unit

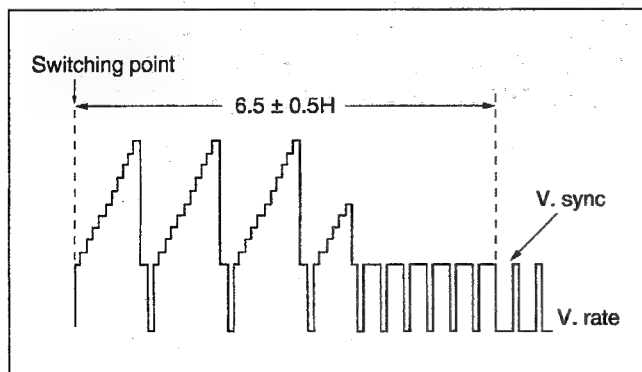


Fig. 3-2-2 PB switching point

#### 3.2.2 Slow tracking preset

Signal	• Tuner or color bar
Mode	• SP/EP, REC → PB(SLOW)
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

**Notes:** • Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.  
• For the FWD slow mode during playback, press the PAUSE button for more than 2 seconds.

- (1) Record a color bar signal in the SP mode.
- (2) Playback recorded signal on the FWD slow mode.
- (3) Set the tracking control to the center position by simultaneously pressing the CH "▲" and "▼" buttons.
- (4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B" or "C" buttons of the presetting unit.
- (5) Depress the STOP button.
- (6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
- (7) Repeat steps (2) to (6) in the REV slow mode.
- (8) Repeat steps (1) to (7) in the EP mode.

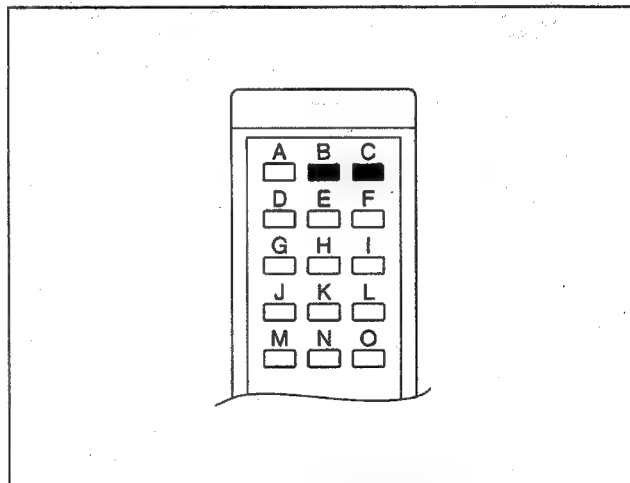


Fig. 3-2-3 Presetting unit

# TV-20240<sub>(US&CA)</sub> STANDARD CIRCUIT DIAGRAM

## ■ NOTE ON USING CIRCUIT DIAGRAMS

### 1. SAFETY

The components identified by the  $\Delta$  symbol and shading are critical for safety. For continued safety replace safety critical components only with manufactures recommended parts.

### 2. SPECIFIED VOLTAGE AND WAVEFORM VALUES

The voltage and waveform values have been measured under the following conditions.

- (1) Input signal : Color bar signal
  - (2) Setting positions of each knob/button and variable resistor : Original setting position when shipped
  - (3) Internal resistance of tester : DC 20k  $\Omega$ /V
  - (4) Oscilloscope sweeping time : H  $\Rightarrow$  20 $\mu$ S/div  
: V  $\Rightarrow$  5mS/div  
: Others  $\Rightarrow$  Sweeping time is specified
  - (5) Voltage values : All DC voltage values
- \* Since the voltage values of signal circuit vary to some extent according to adjustments, use them as reference values.

### 3. INDICATION OF PARTS SYMBOL [EXAMPLE]

- In the PW board : R1209  $\rightarrow$  R209

### 4. INDICATIONS ON THE CIRCUIT DIAGRAM

#### (1) Resistors

##### ● Resistance value

- No unit : [ $\Omega$ ]
- K : [K  $\Omega$ ]
- M : [M  $\Omega$ ]

##### ● Rated allowable power

- No indication : 1/10[W]
- Others : As specified

##### ● Type

- No indication : Carbon resistor
- OMR : Oxide metal film resistor
- MFR : Metal film resistor
- MPR : Metal plate resistor
- UNFR : Uninflammable resistor
- FR : Fusible resistor

\* Composition resistor 1/2 [W] is specified as 1/2S or Comp.

#### (2) Capacitors

##### ● Capacitance value

- 1 or higher : [pF]
- less than 1 : [ $\mu$ F]

##### ● Withstand voltage

- No indication : DC50[V]
- AC indication : AC withstand voltage [V]
- Others : DC withstand voltage [V]

\* Electrolytic Capacitors

47/50[Example]: Capacitance value [ $\mu$ F]/withstand voltage[V]

##### ● Type

- No indication : Ceramic capacitor
- MY : Mylar capacitor
- MM : Metalized mylar capacitor
- PP : Polypropylene capacitor
- MPP : Metalized polypropylene capacitor
- MF : Metalized film capacitor
- TF : Thin film capacitor
- BP : Bipolar electrolytic capacitor
- TAN : Tantalum capacitor

##### (3) Coils

- No unit : [ $\mu$ H]
- Others : As specified

##### (4) Power Supply



\* Respective voltage values are indicated

##### (5) Test point

- : Test point
- : Only test point display

##### (6) Connecting method

- : Connector
- : Wrapping or soldering
- : Receptacle

##### (7) Ground symbol

- : LIVE side ground
- : ISOLATED(NEUTRAL) side ground
- : EARTH ground
- : DIGITAL ground

## 5. NOTE FOR REPAIRING SERVICE

This model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : ( $\perp$ ) side GND and the ISOLATED(NEUTRAL) : ( $\nabla$ ) side GND. Therefore, care must be taken for the following points.

- (1) Do not touch the LIVE side GND or the LIVE side GND and the ISOLATED(NEUTRAL) side GND simultaneously. If the above caution is not respected, an electric shock may be caused. Therefore, make sure that the power cord is surely removed from the receptacle when, for example, the chassis is pulled out.
- (2) Do not short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or never measure with a measuring apparatus (oscilloscope, etc.) the LIVE side GND and ISOLATED(NEUTRAL) side GND at the same time. If the above precaution is not respected, a fuse or any parts will be broken.

◇ Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice

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## CIRCUIT DIAGRAMS (VCR)



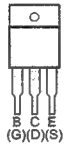
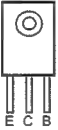
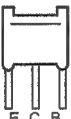

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CHANNEL CHART (US) ..... 4-37

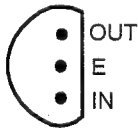
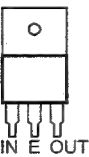
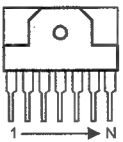
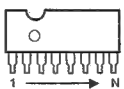
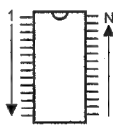
CHANNEL CHART (CA) ..... 4-38

## SEMICONDUCTOR SHAPES

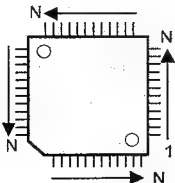
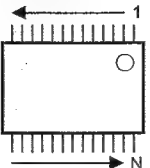
### TRANSISTOR

BOTTOM VIEW	FRONT VIEW				TOP VIEW
					CHIP TR 

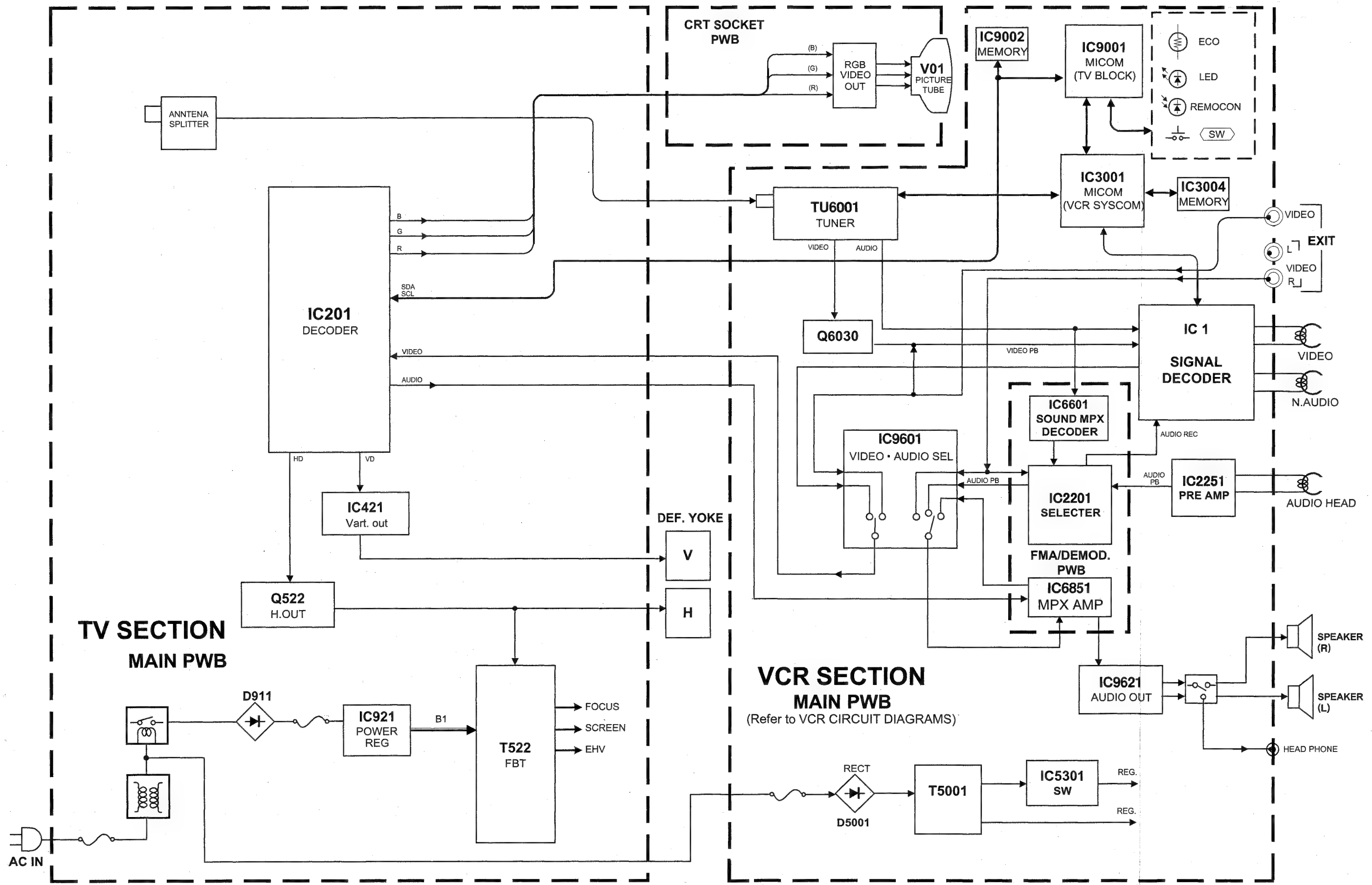
### IC

BOTTOM VIEW	FRONT VIEW			TOP VIEW
				

### CHIP IC

TOP VIEW		
		

**BLOCK DIAGRAM**

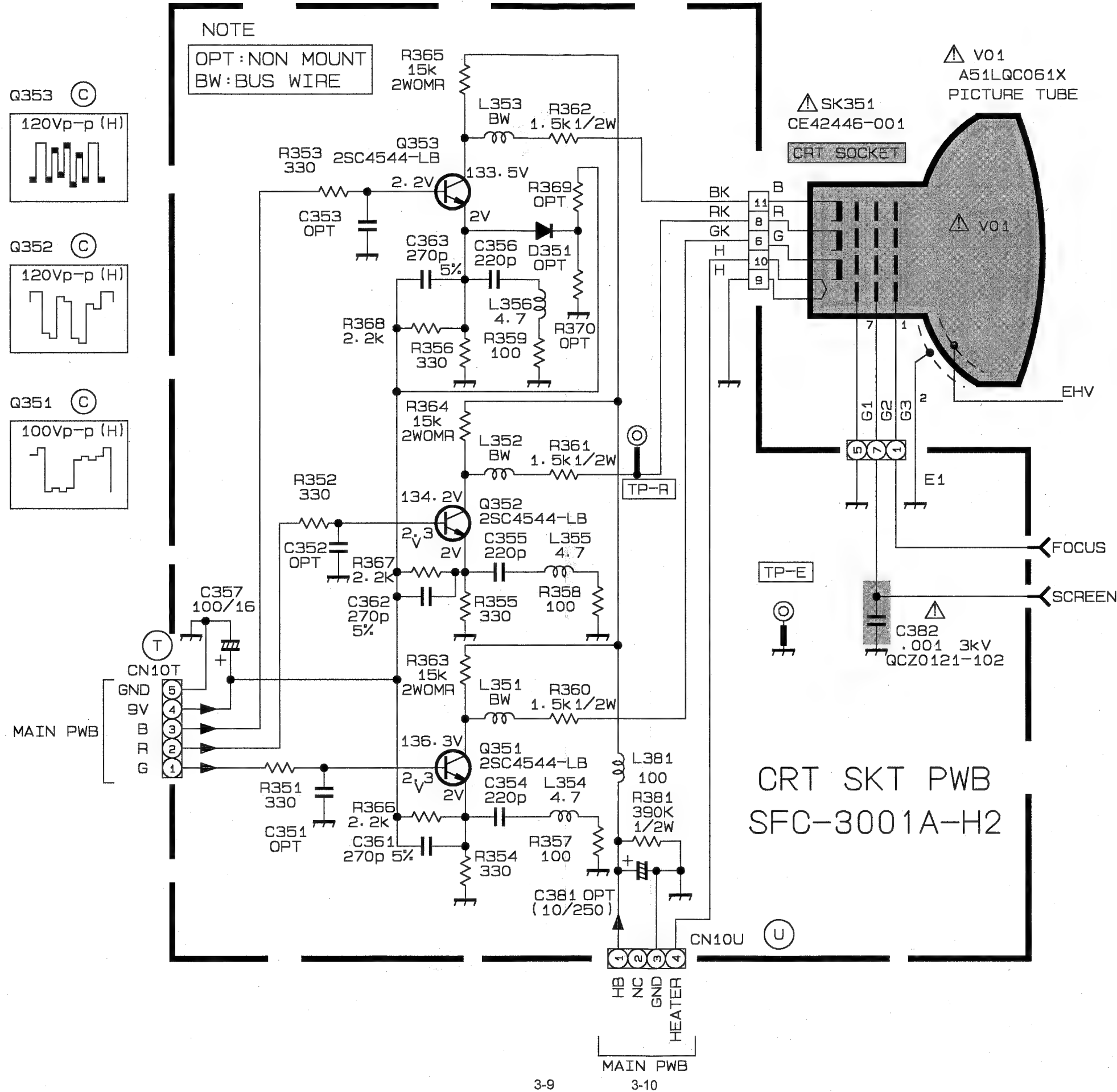


## MAIN PWB CIRCUIT DIAGRAMS



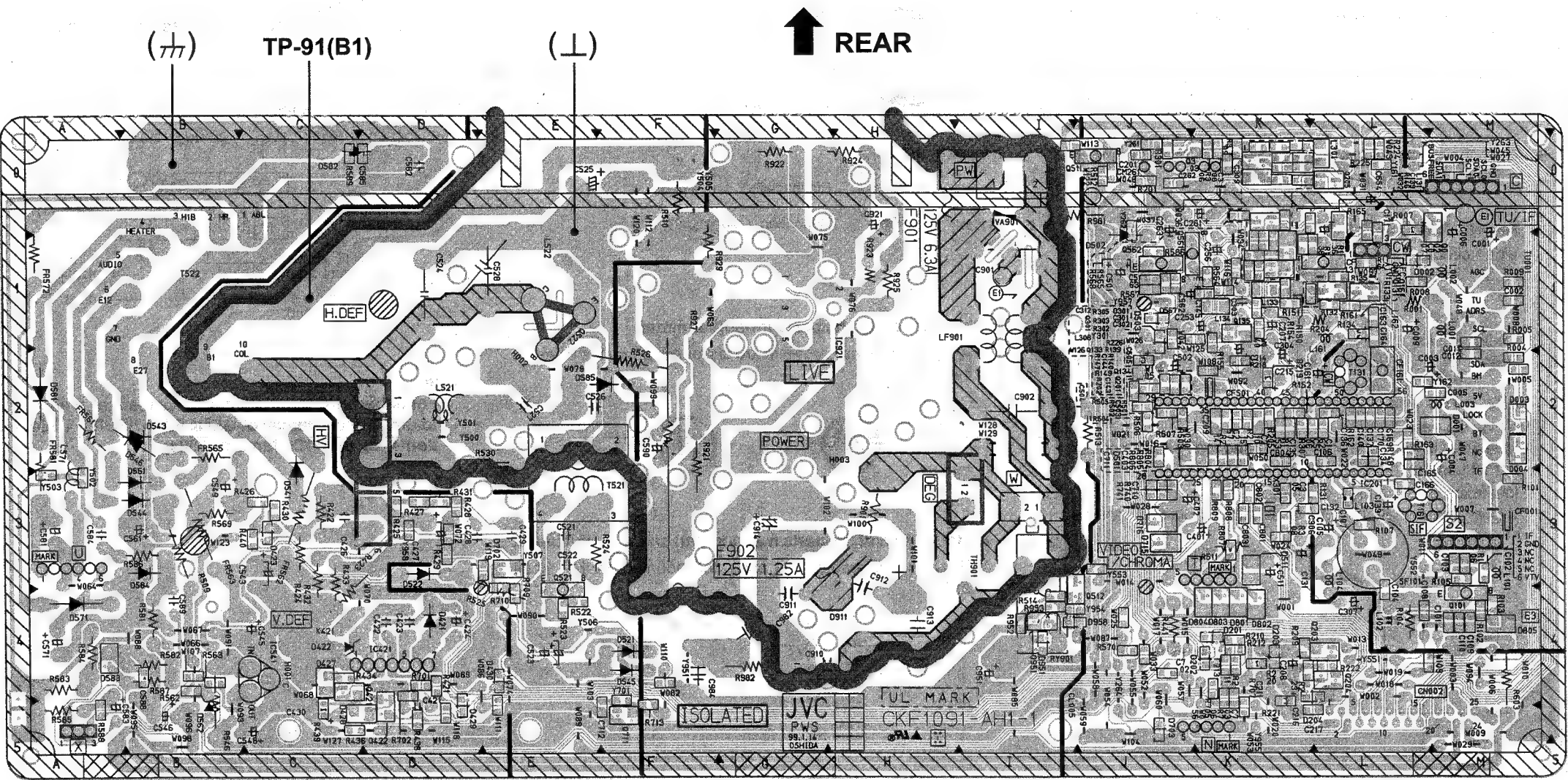


CRT SOCKET PWB CIRCUIT DIAGRAM

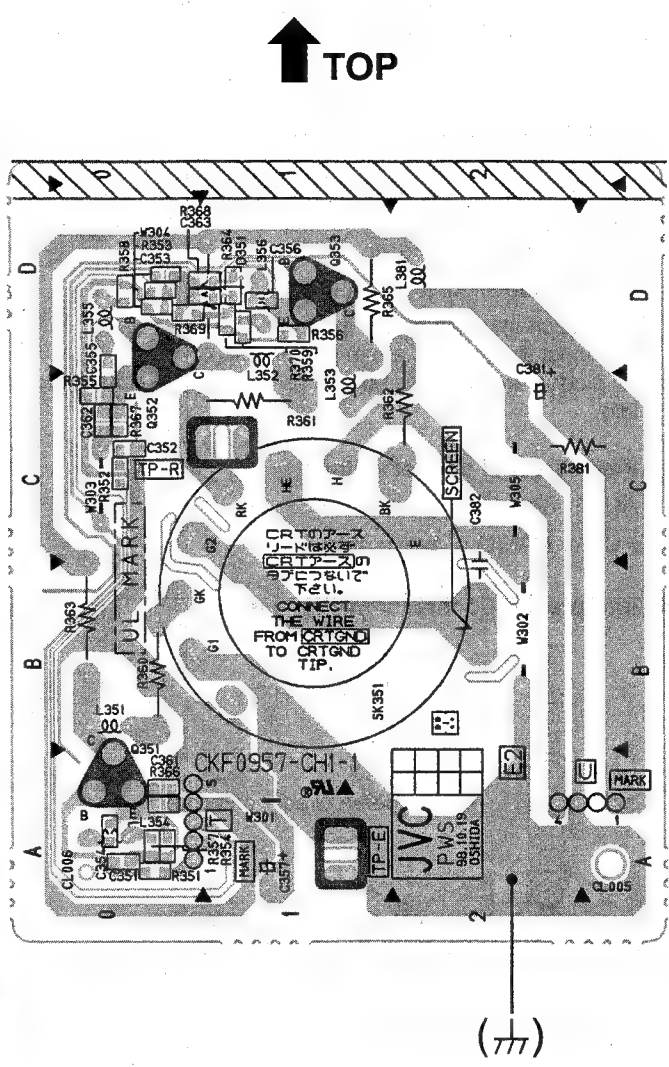




MAIN PWB PATTERN




CRT SOCKET PWB PATTERN





CIRCUIT DIAGRAMS(VCR)

NOTES OF SCHEMATIC DIAGRAM

**Safety precautions**  
The Components identified by the symbol  are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

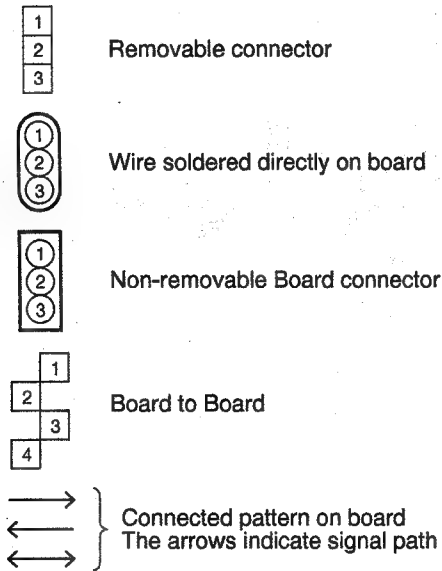
1. Units of components on the schematic diagram

- Unless otherwise specified.
- 1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).  
Chip resistors are 1/16 W.  
K: KΩ (1000Ω), M: MΩ (1000KΩ)
  - 2) All capacitance values are in μF, (P: PF).
  - 3) All inductance values are in μH, (m: mH).
  - 4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

- AUX : Active at high  
AUX or AUX(L) : Active at low

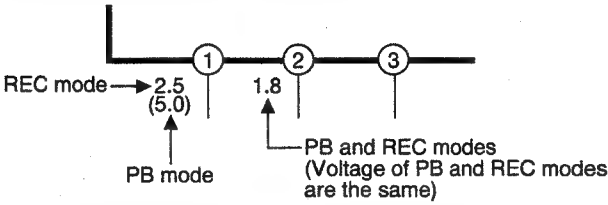
3. Interpreting Connector indications



4. Voltage measurement

- 1) Video circuits  
REC : Colour bar signal in SP mode, normal VHS mode  
PB : Alignment tape, colour bar SP mode, normal VHS mode  
— : Unmeasurable or unnecessary to measure
- 2) Audio circuits  
REC : 1KHz, -8 dBs sine wave signal in SP mode, Normal VHS mode  
PB : REC then playback it
- 3) Movie Camera circuits  
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode

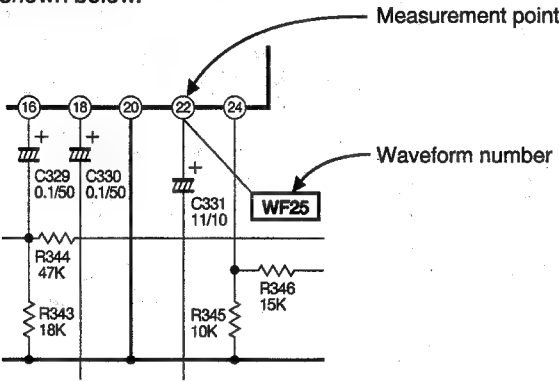
- 4) Indication on schematic diagram  
Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



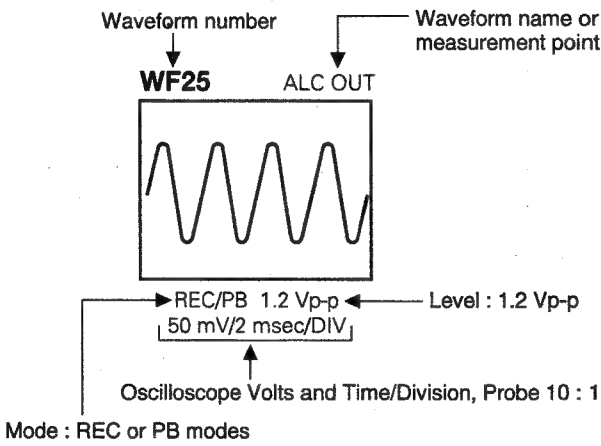
**Note:** If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

- 1) Video circuits  
REC : Colour bar signal in SP mode, normal VHS mode  
PB : Alignment tape, colour bar SP mode, normal VHS mode
- 2) Audio circuits  
REC : 1KHz, -8 dBs sine wave signal in SP mode, normal VHS mode  
PB : REC then playback it
- 3) Movie Camera circuits  
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
- 4) Indication on schematic diagram  
Waveform indications on the schematic diagram are as shown below.

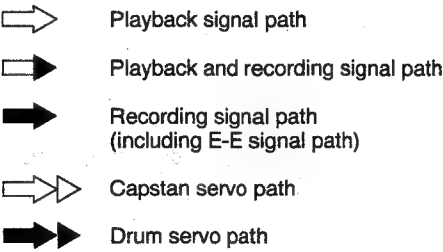


5) Waveform indications

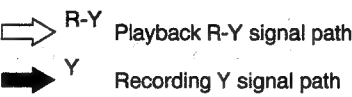


6. Signal path Symbols

The arrows indicate the signal path as follows.



(Example)



7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



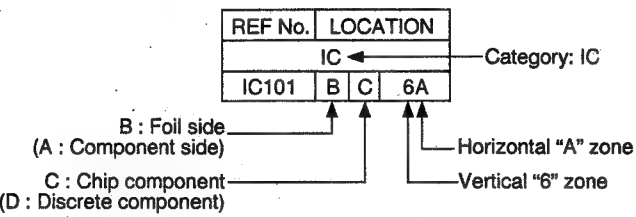
CIRCUIT BOARD NOTES

1. Foil and Component sides

- 1) Foil side (B side) :  
Parts on the foil side seen from foil face (pattern face) are indicated.
- 2) Component side (A side) :  
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

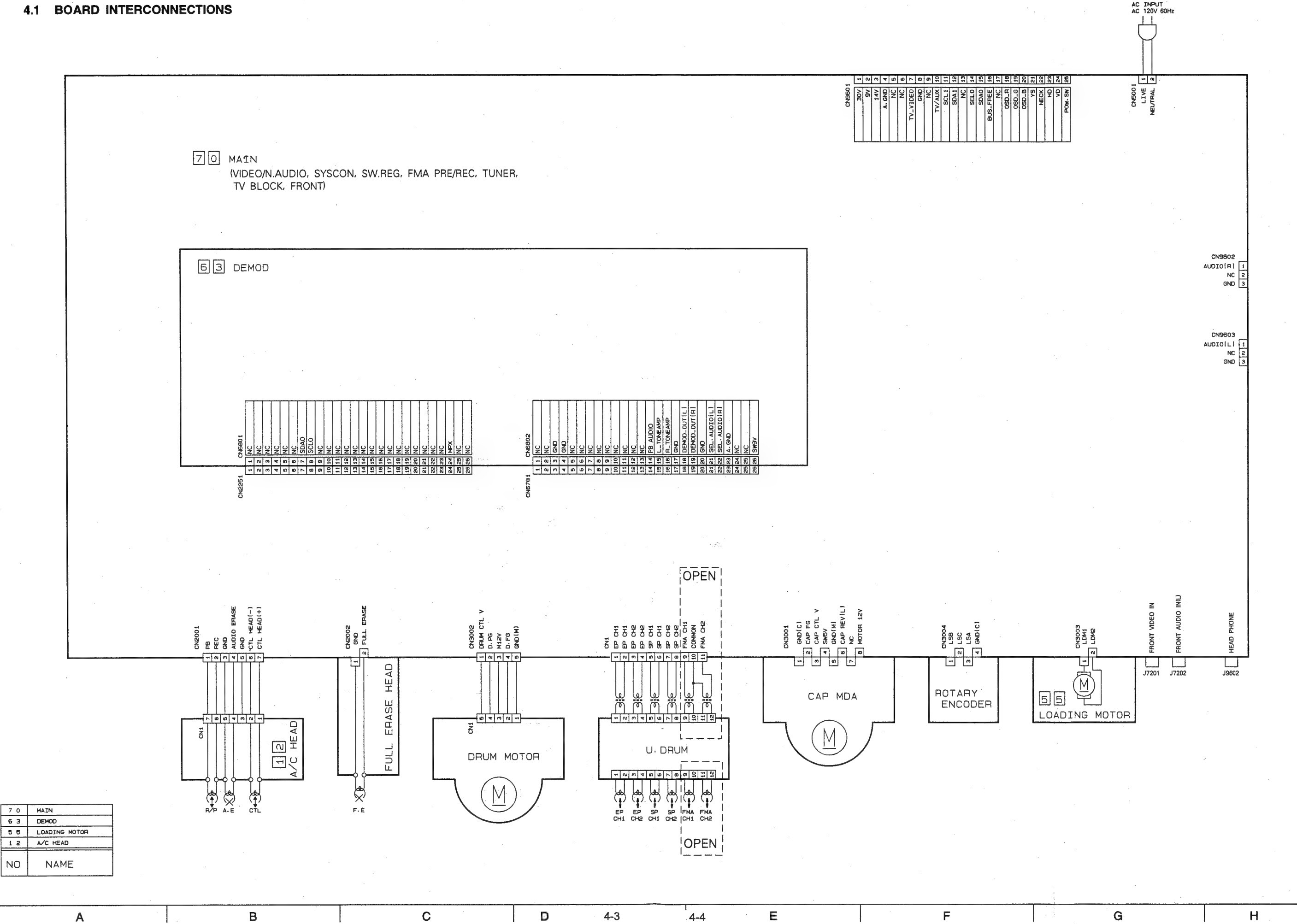
Parts location are indicated by guide scale on the circuit board.



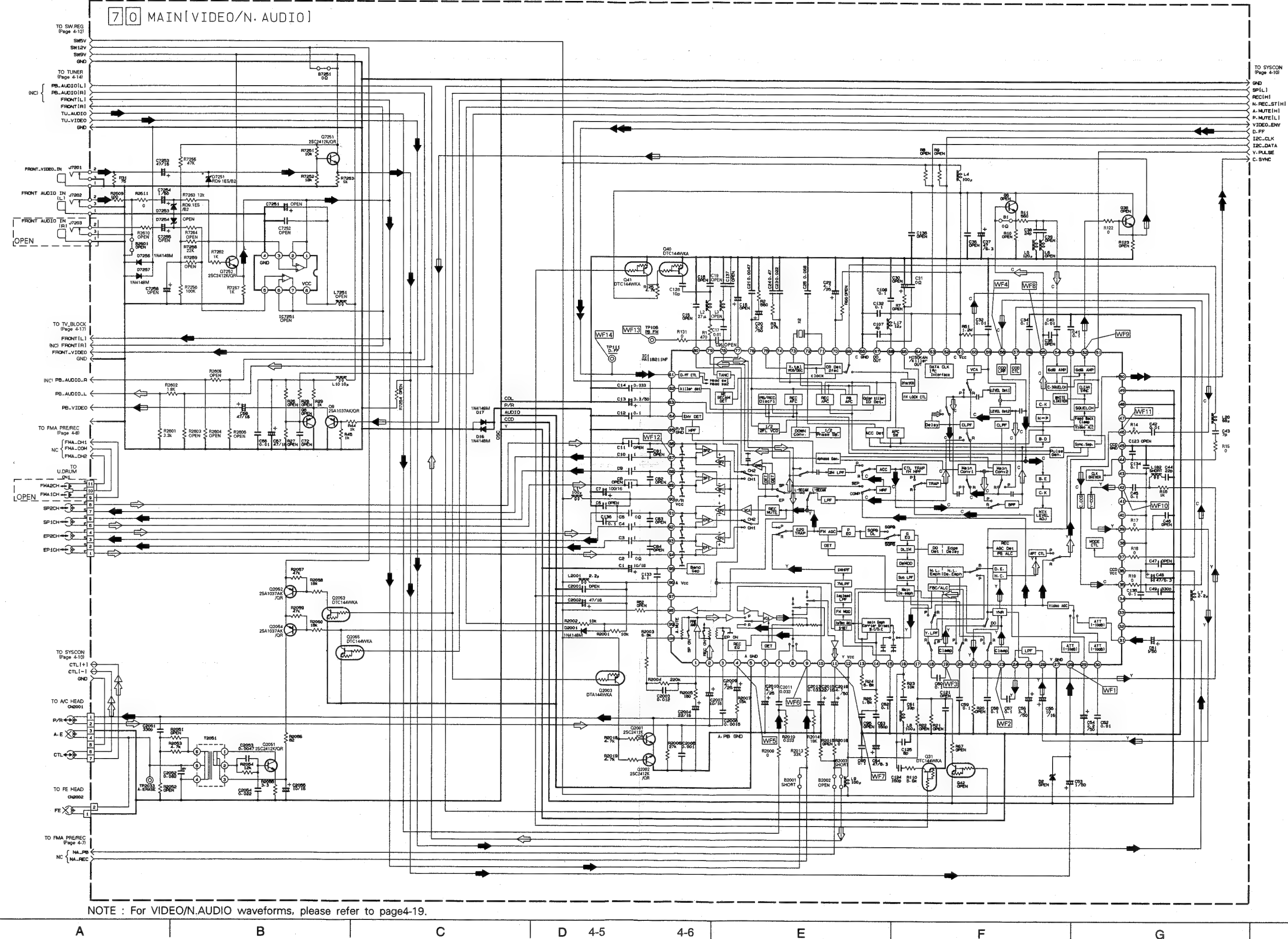
**Note:**

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

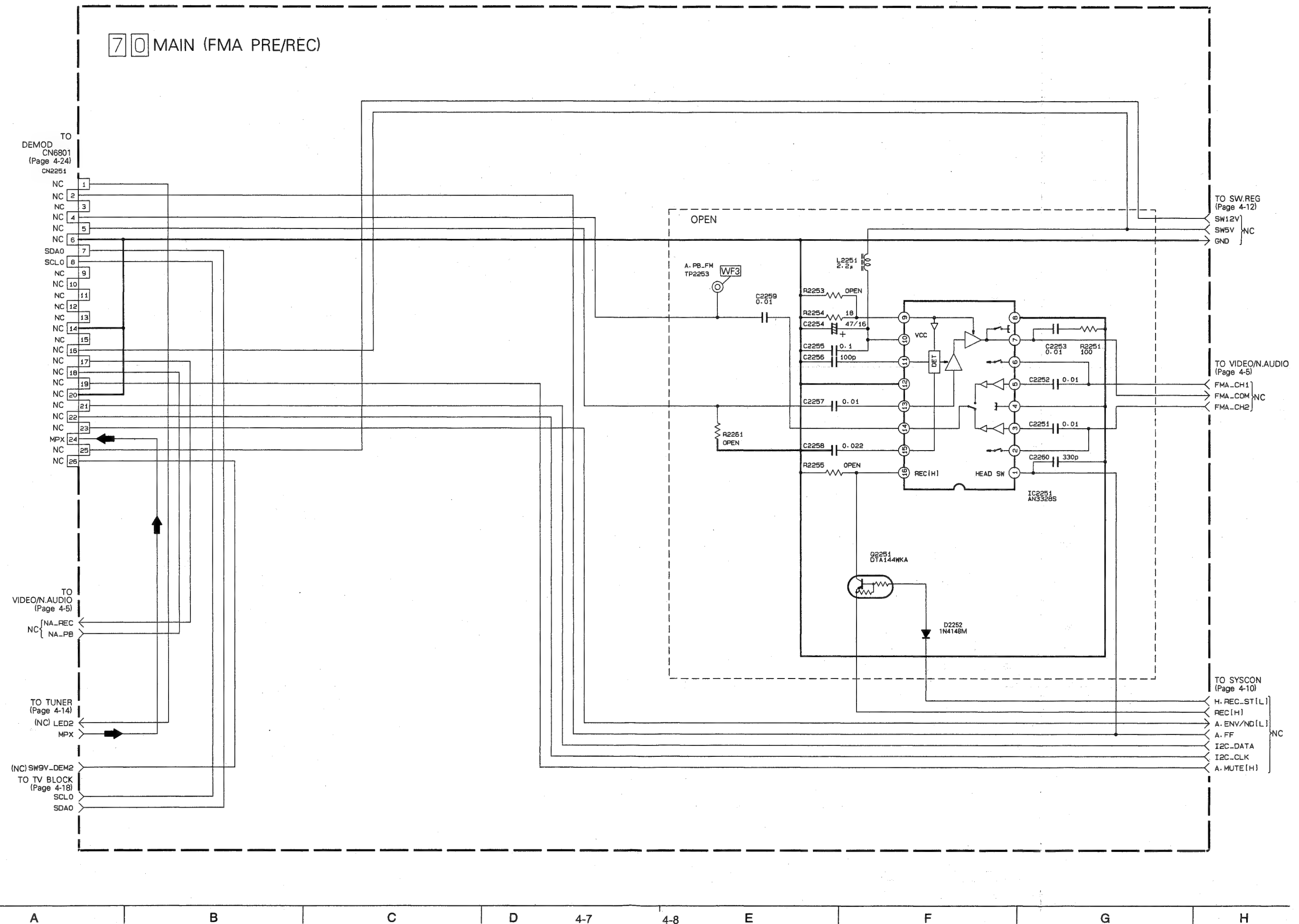
4.1 BOARD INTERCONNECTIONS



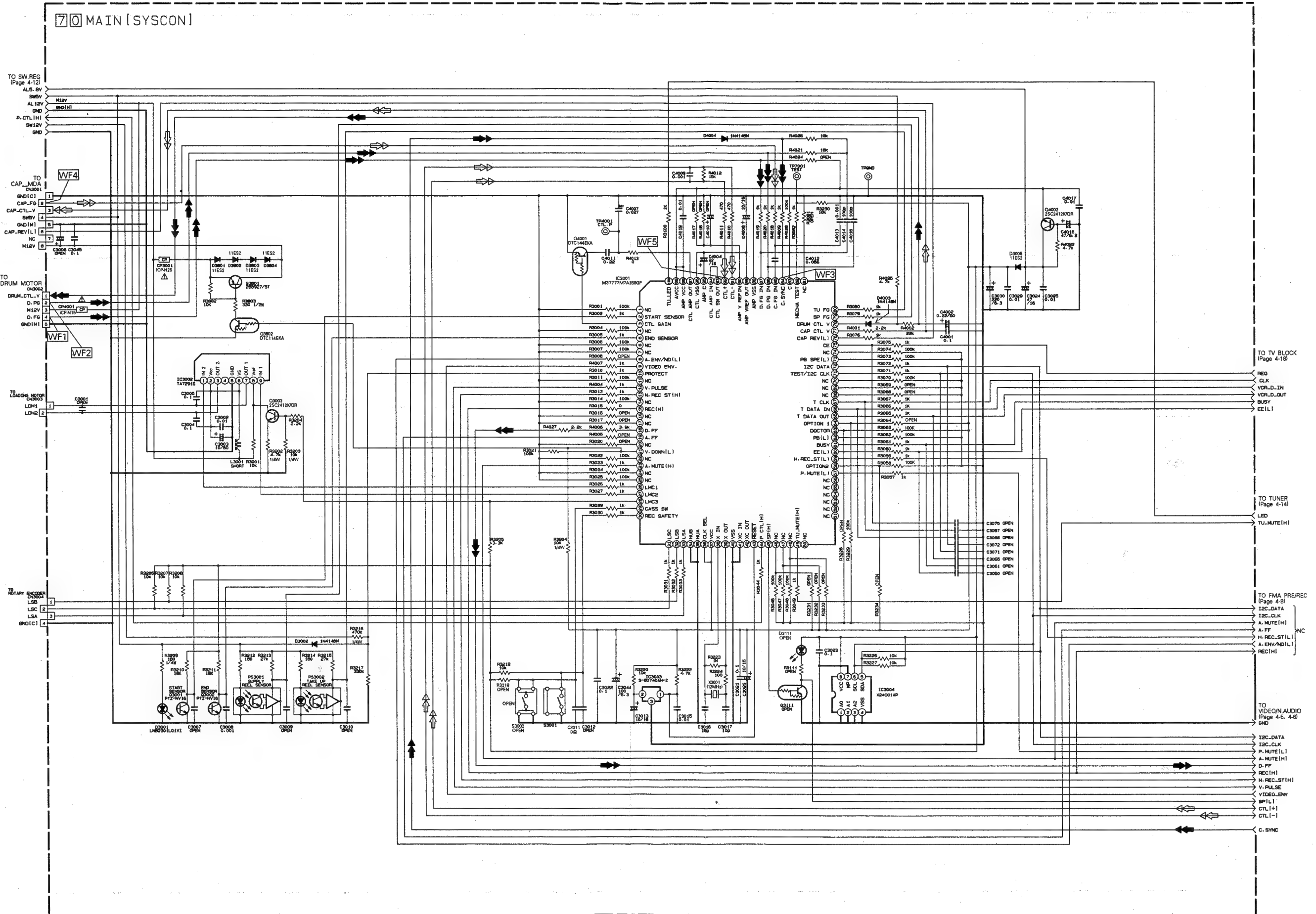
## 4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM



# 4.3 FMA PRE/REC SCHEMATIC DIAGRAM

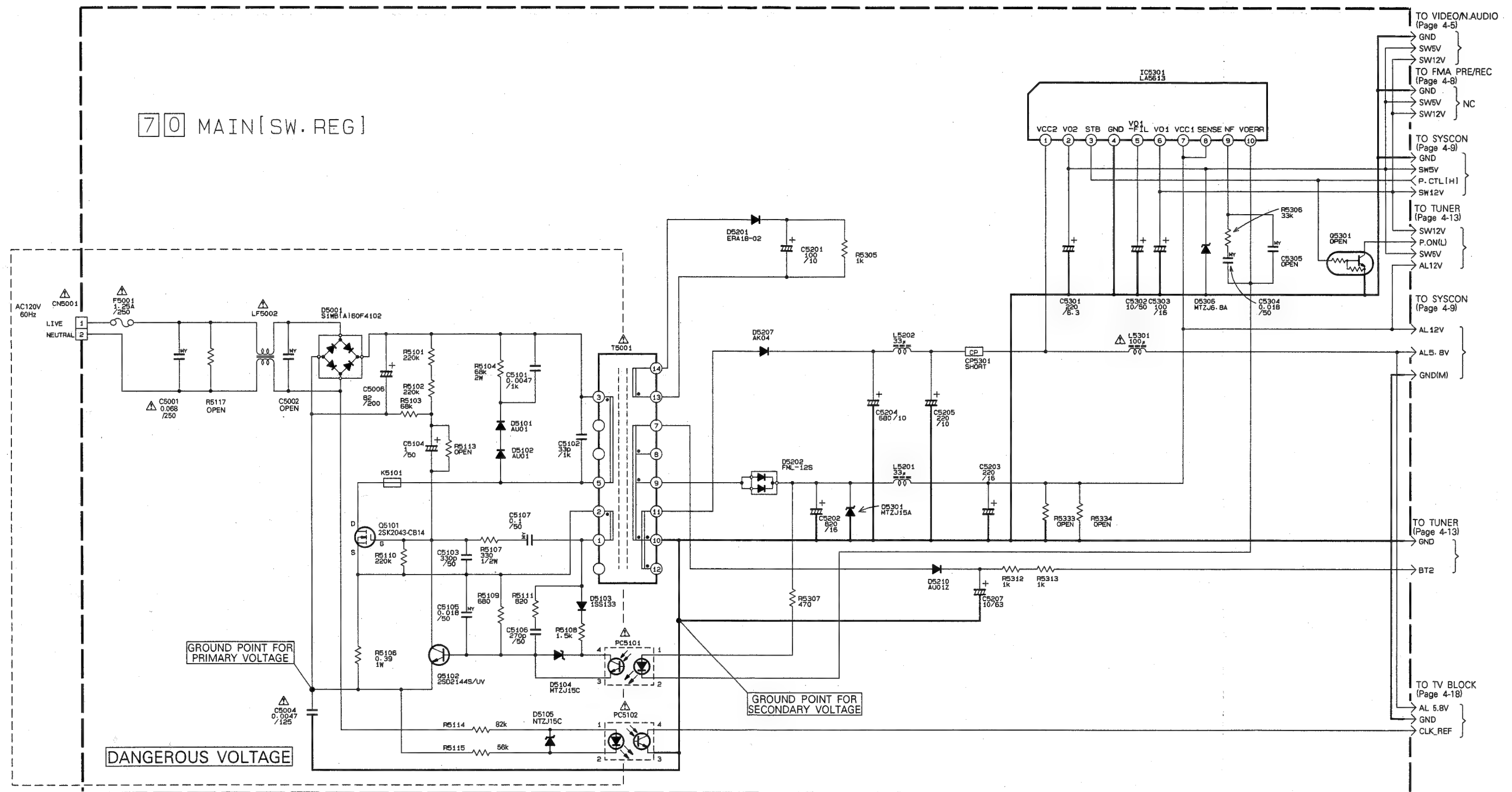


#### 4.4 SYSTEM CONTROL SCHEMATIC DIAGRAM

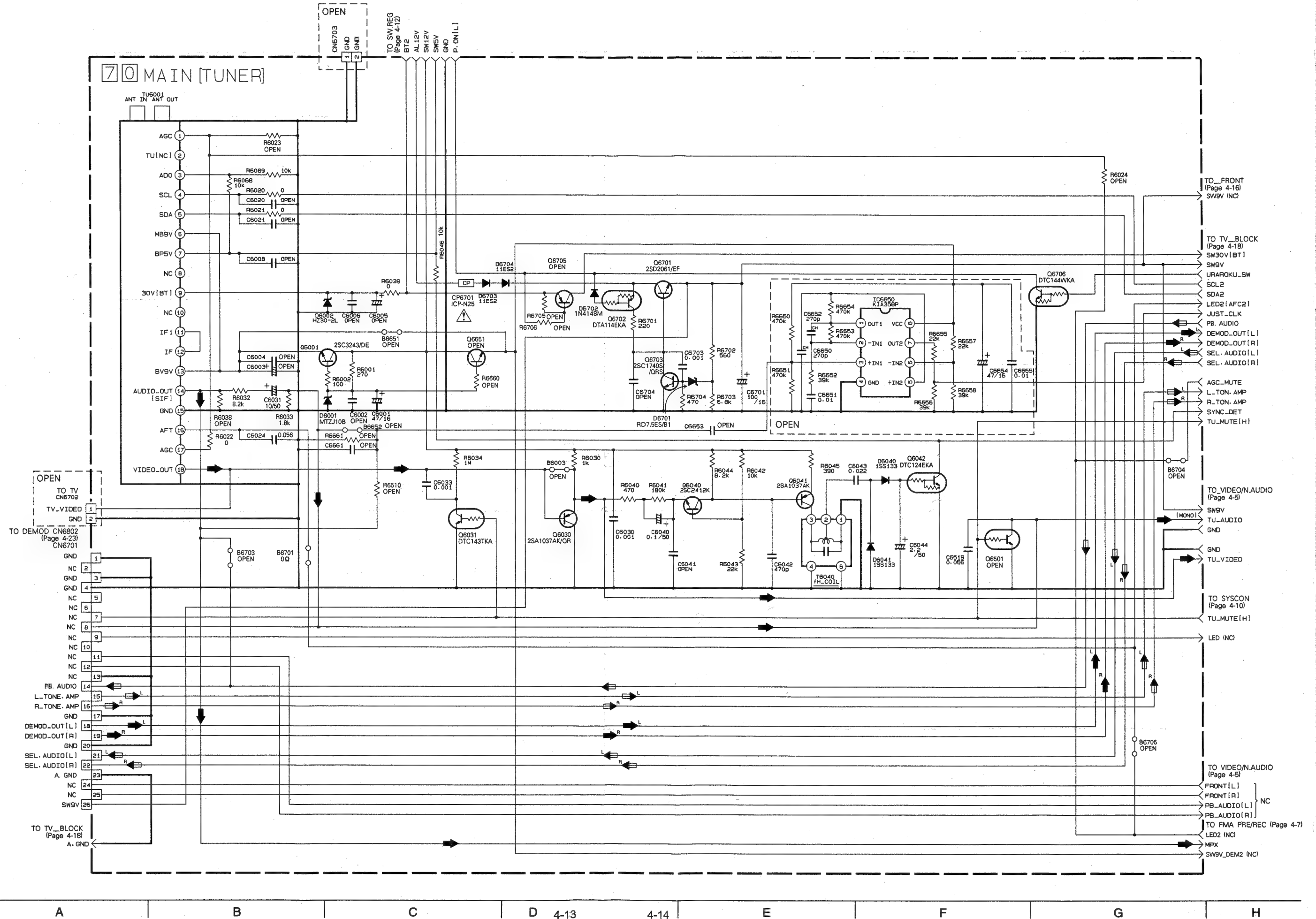


- NOTES : 1. For SYSCON waveforms, please refer to page 4-19.  
2. Be sure to remove R3063 when replacing the system controller IC3001 and EEPROM IC3004.

```
70 MAIN[SW.REG]
```



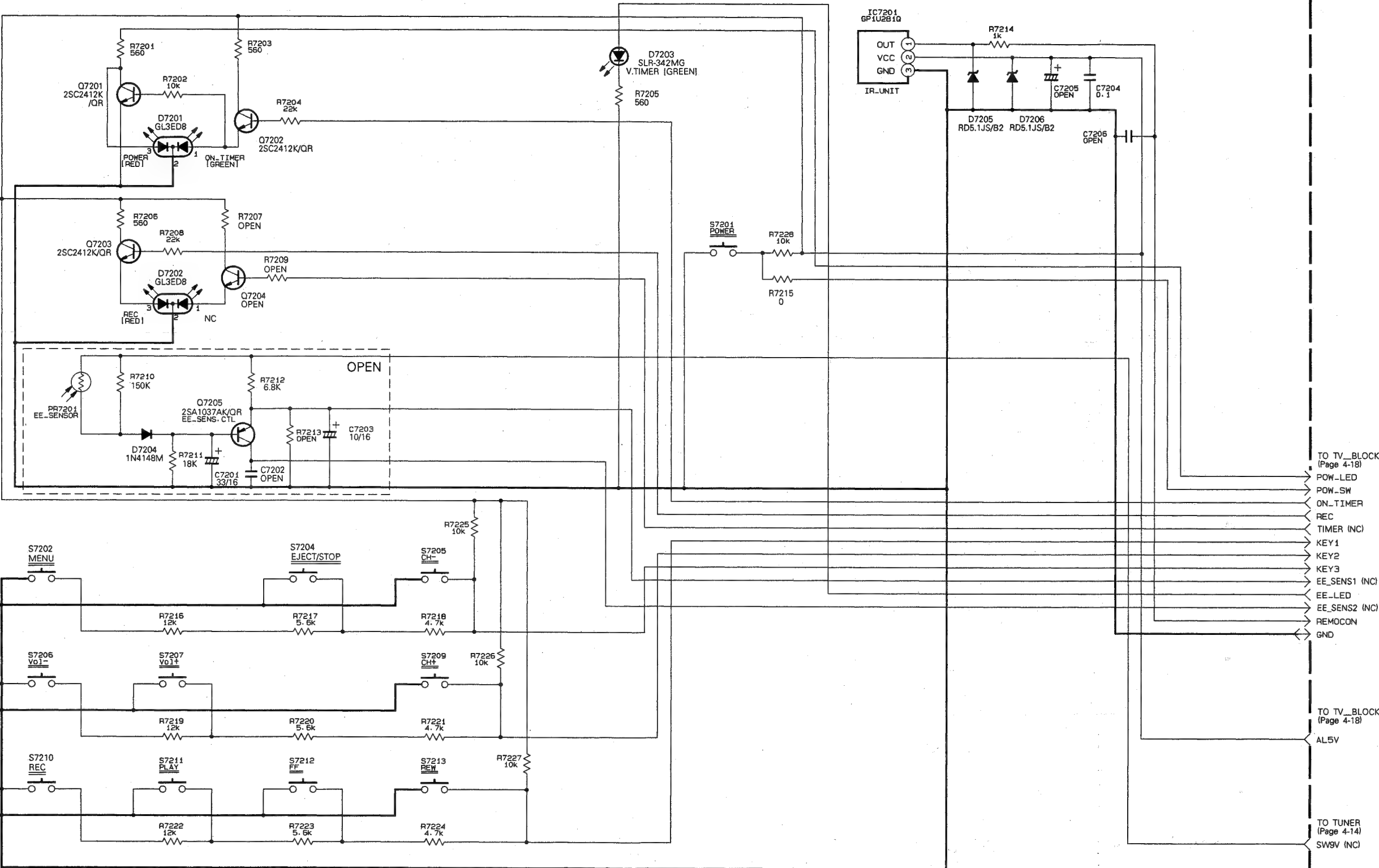
#### 4.6 TUNER SCHEMATIC DIAGRAM





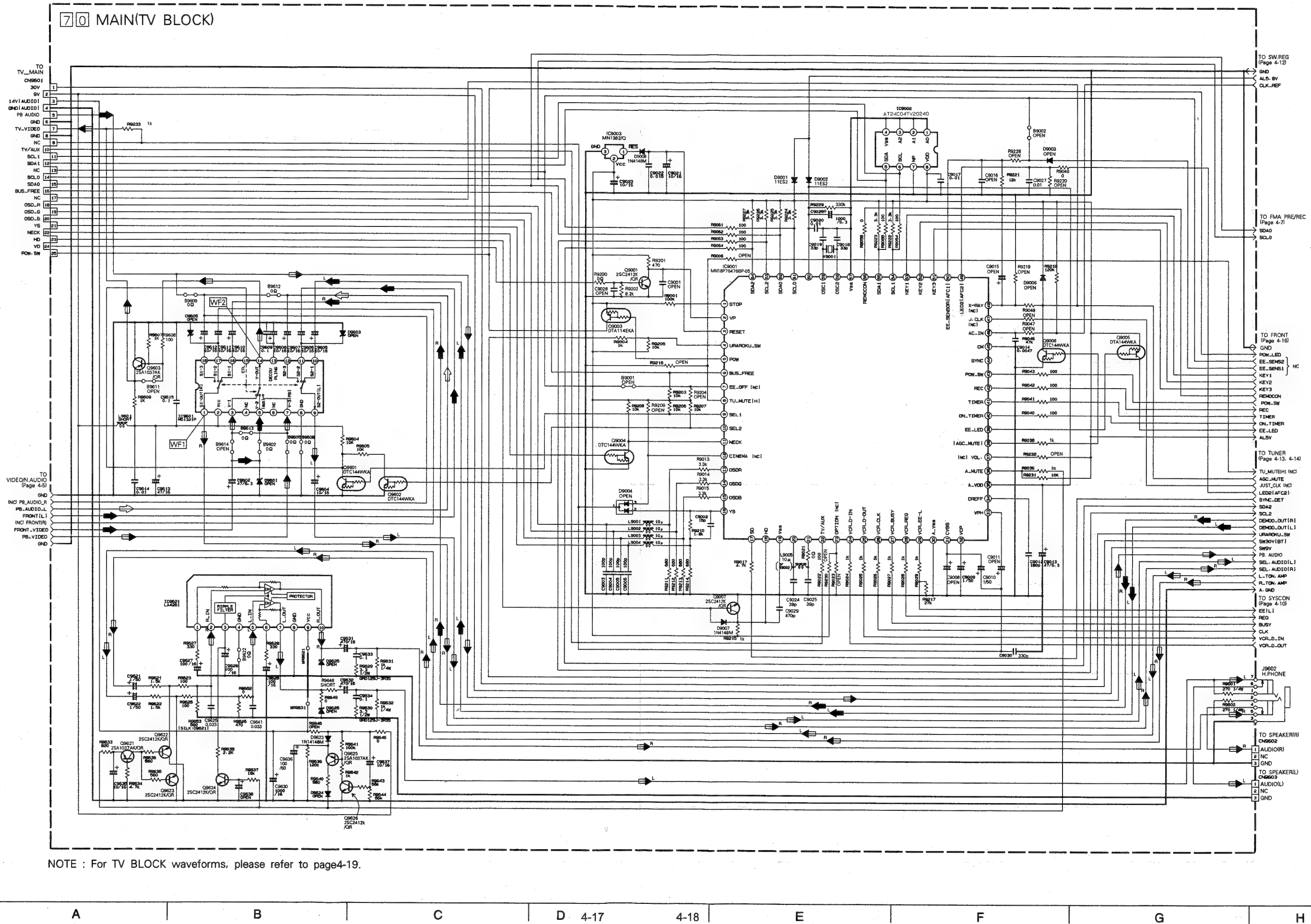
4.7 FRONT SCHEMATIC DIAGRAM

70 MAIN[FRONT]



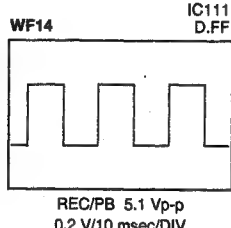
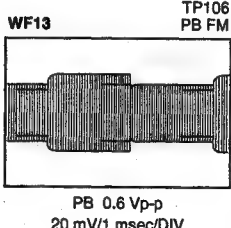
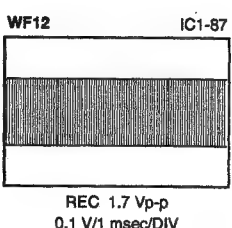
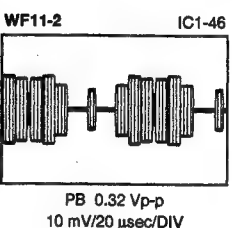
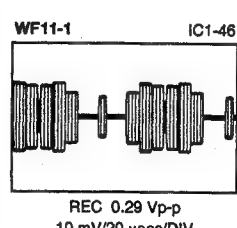
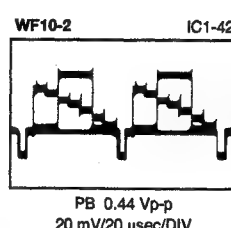
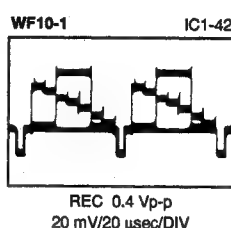
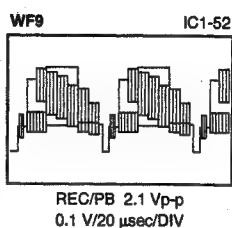
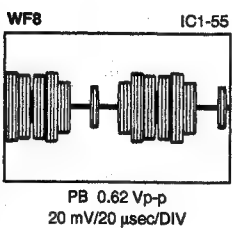
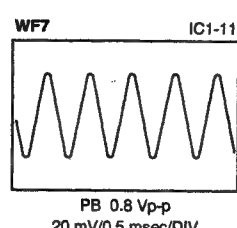
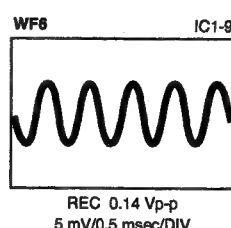
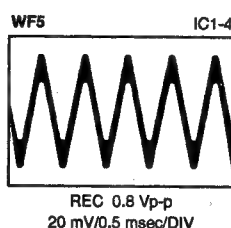
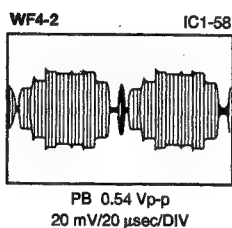
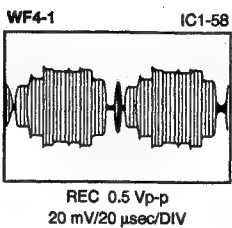
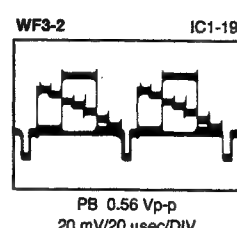
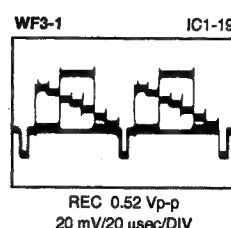
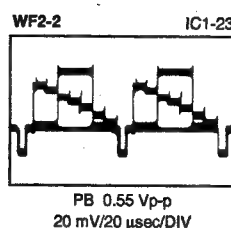
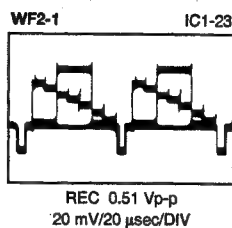
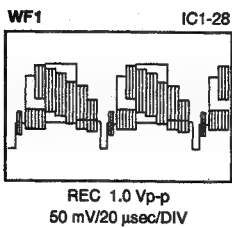


4.8 TV BLOCK SCHEMATIC DIAGRAM

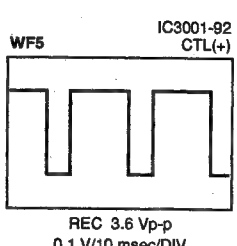
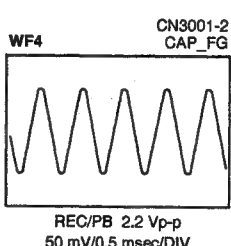
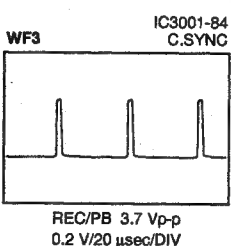
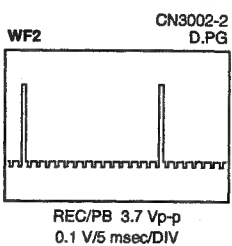
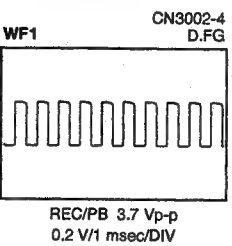


## WAVEFORMS

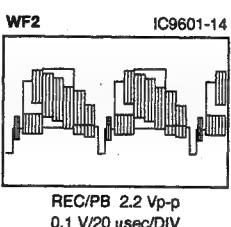
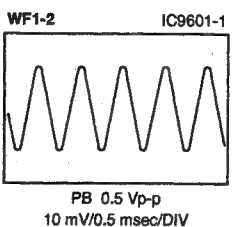
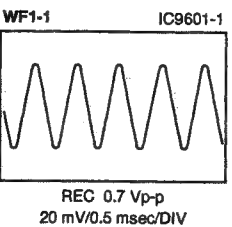
### — VIDEO/N.AUDIO —



### — SYSCON —



### — TV BLOCK —



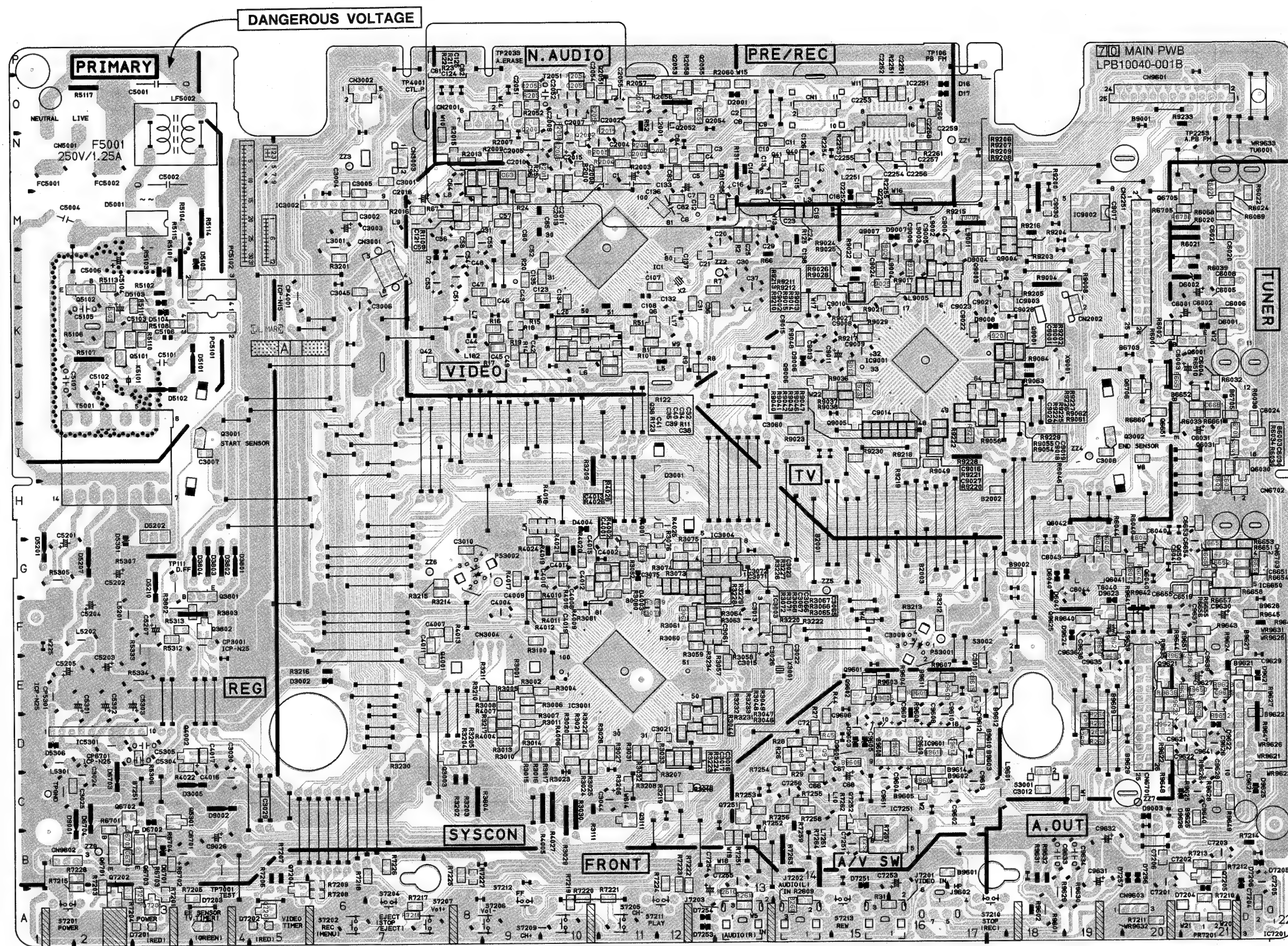
# COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
<b>CAPACITOR</b>															
C1	A	D	11N	C3006	A	D	7L	C9013	A	D	14K	D7256	A	D	20A
C2	A	D	13O	C3007	A	D	4J	C9014	A	D	16J	D7257	A	D	20B
C3	A	D	12N	C3008	B	C	19I	C9015	A	D	14K	D9001	A	D	20C
C4	B	C	12N	C3009	B	C	16F	C9016	A	D	16I	D9002	A	D	4C
C5	B	C	12N	C3010	B	C	8G	C9017	B	C	19M	D9003	A	D	20C
C6	B	C	12N	C3011	B	C	17E	C9018	B	C	17J	D9004	A	D	17M
C7	A	D	12N	C3012	B	C	18C	C9019	B	C	17J	D9006	A	D	14K
C8	A	D	12N	C3013	B	C	13F	C9020	B	C	17J	D9007	A	D	15M
C9	A	D	13O	C3015	A	D	13F	C9021	A	D	17K	D9008	A	D	17K
C10	B	C	13N	C3016	B	C	12D	C9022	A	D	17K	D9003	A	D	15D
C11	B	C	13N	C3017	B	C	12D	C9023	A	D	17L	D9005	A	D	15D
C12	B	C	14N	C3021	A	D	12D	C9024	A	D	15L	D9021	A	D	22E
C13	B	C	12M	C3023	A	D	14E	C9025	A	D	15L	D9022	A	D	21D
C14	B	C	13N	C3024	B	C	13G	C9026	A	D	4B	D9023	A	D	20F
C15	B	C	13N	C3025	B	C	2D	C9027	A	D	16I	D9024	A	D	19F
C16	B	C	14N	C3026	A	D	2C	C9028	B	C	18K	D9025	A	D	22C
C17	B	C	13M	C3029	A	D	13F	C9029	B	C	16L	D9026	A	D	21C
C18	B	C	13M	C3030	A	D	5C	C9030	B	C	18M				
C19	B	C	14M	C3034	A	D	4C	C9032	B	C	17C				
C20	B	C	13M	C3045	A	D	11C	C9034	A	D	16C				
C21	B	C	12L	C3060	A	D	6L	C9035	A	D	15D				
C22	B	C	14M	C3061	A	D	14J	C9036	A	D	16D				
C23	B	C	14M	C3065	B	C	13F	C9037	A	D	16D				
C24	B	C	14M	C3066	B	C	13G	C9038	A	D	16D				
C25	B	C	13M	C3067	B	C	12G	C9039	A	D	16D				
C26	B	C	13M	C3071	B	C	12G	C9040	A	D	16D				
C27	B	C	13L	C3072	B	C	12G	C9041	A	D	16D				
C28	B	C	12L	C3075	B	C	11G	C9043	A	D	17C				
C29	B	C	11K	C4001	B	C	11G	C9044	A	D	17C				
C30	B	C	11K	C4002	A	D	11G	C9045	B	C	17E				
C31	B	C	10K	C4003	A	D	9F	C9046	B	C	21D				
C32	B	C	10K	C4004	A	D	8F	C9047	B	C	21D				
C33	B	C	13L	C4007	A	D	10G	C9048	B	C	21E				
C34	B	C	11J	C4008	A	D	9F	C9049	B	C	21E				
C35	B	C	10K	C4010	A	D	10G	C9050	B	C	21E				
C36	B	C	10K	C4011	A	D	10G	C9051	B	C	21E				
C37	B	C	9K	C4012	A	D	10G	C9052	B	C	21E				
C38	B	C	9K	C4013	A	D	10G	C9053	B	C	21E				
C39	B	C	8K	C4014	A	D	10G	C9054	B	C	21E				
C40	B	C	9K	C4015	A	D	10G	C9055	B	C	21E				
C41	B	C	9K	C4016	A	D	10G	C9056	B	C	21E				
C42	B	C	9K	C4017	A	D	10G	C9057	B	C	21E				
C43	B	C	9K	C4018	A	D	10G	C9058	B	C	21E				
C44	B	C	9K	C4019	A	D	10G	C9059	B	C	21E				
C45	B	C	9K	C4020	A	D	10G	C9060	B	C	21E				
C46	B	C	9K	C4021	A	D	10G	C9061	B	C	21E				
C47	B	C	9K	C4022	A	D	10G	C9062	B	C	21E				
C48	B	C	9K	C4023	A	D	10G	C9063	B	C	21E				
C49	B	C	9K	C4024	A	D	10G	C9064	B	C	21E				
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C52	B	C	9K	C4027	A	D	10G	C9067	B	C	21E				
C53	B	C	9K	C4028	A	D	10G	C9068	B	C	21E				
C54	B	C	9K	C4029	A	D	10G	C9069	B	C	21E				
C55	B	C	9K	C4030	A	D	10G	C9070	B	C	21E				
C56	B	C	9K	C4031	A	D	10G	C9071	B	C	21E				
C57	B	C	9K	C4032	A	D	10G	C9072	B	C	21E				
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C60	B	C	9K	C4035	A	D	10G	C9075	B	C	21E				
C61	B	C	9K	C4036	A	D	10G	C9076	B	C	21E				
C62	B	C	9K	C4037	A	D	10G	C9077	B	C	21E				
C63	B	C	9K	C4038	A	D	10G	C9078	B	C	21E				
C64	B	C	9K	C4039	A	D	10G	C9079	B	C	21E				
C65	B	C	9K	C4040	A	D	10G	C9080	B	C	21E				
C66	B	C	9K	C4041	A	D	10G	C9081	B	C	21E				
C67	B	C	9K	C4042	A	D	10G	C9082	B	C	21E				
C68	B	C	9K	C4043	A	D	10G	C9083	B	C	21E				
C69	B	C	9K	C4044	A	D	10G	C9084	B	C	21E				
C70	B	C	9K	C4045	A	D	10G	C9085	B	C	21E				
C71	B	C	9K	C4046	A	D	10G	C9086	B	C	21E				
C72	B	C	9K	C4047	A	D	10G	C9087	B	C	21E				
C73	B	C	9K	C4048	A	D	10G	C9088	B	C	21E				
C74	B	C	9K	C4049	A	D	10G	C9089	B	C	21E				
C75	B	C	9K	C4050	A	D	10G	C9090	B	C	21E				
C76	B	C	9K	C4051	A	D	10G	C9091	B	C	21E				
C77	B	C	9K	C4052	A	D	10G	C9092	B	C	21E				
C78	B	C	9K	C4053	A	D	10G	C9093	B	C	21E				
C79	B	C	9K	C4054	A	D	10G	C9094	B	C	21E				
C80	B	C	9K	C4055	A	D	10G	C9095	B	C	21E				
C81	B	C	9K	C4056	A	D	10G	C9096	B	C	21E				
C82	B	C	9K	C4057	A	D	10G	C9097	B	C	21E				
C83	B	C	9K	C4058	A	D	10G	C9098	B	C	21E				
C84	B	C	9K	C4059	A	D	10G	C9099	B	C	21E				
C85	B	C	9K	C4060	A	D	10G	C9100	B	C	21E				
C86	B	C	9K	C4061	A	D	10G	C9101	B	C	21E				
C87	B	C	9K	C4062	A	D	10G	C9102	B	C	21E				
C88	B	C	9K	C4063	A	D	10G	C9103	B	C	21E				
C89	B	C	9K	C4064	A	D	10G	C9104	B	C	21E				
C90	B	C	9K	C4065	A	D	10G	C9105	B	C	21E				
C91	B	C	9K	C4066	A	D	10G	C9106	B	C	21E				
C92	B	C	9K	C4067	A	D	10G	C9107	B	C	21E				
C93	B	C	9K	C4068	A	D	10G	C9108	B	C	21E				
C94	B	C	9K	C4069	A	D	10G	C9109	B	C	21E				
C95	B	C	9K	C4070	A	D	10G	C9110	B	C	21E				
C96	B	C	9K	C4071	A	D	10G	C9111	B	C	21E				
C97	B	C	9K	C4072	A	D	10G	C9112	B	C	21E				
C98	B	C	9K	C4073	A	D	10G	C9113	B	C	21E				
C99	B	C	9K	C4074	A	D	10G	C9114	B	C	21E				
C100	B	C	9K	C4075	A	D	10G	C9115	B	C	21E				
C101	B	C	9K	C4076	A	D	10G	C9116	B	C	21E				
C102	B	C	9K	C4077	A	D	10G	C9117	B	C	21E				
C103	B	C	9K	C4078	A	D	10G	C9118	B	C	21E				
C104	B	C	9K	C4079	A	D	10G	C9119	B	C	21E				
C105	B	C	9K	C4080	A	D	10G	C9120	B	C	21E				
C106	B	C	9K	C4081	A	D	10G	C9121	B	C	21E				
C107	B	C	9K	C4082	A	D	10G	C9122	B	C	21E				
C108	B	C	9K	C4083	A	D	10G	C9123	B	C	21E				
C109	B	C	9K	C4084	A	D	10G	C9124	B	C	21E				
C110	B	C	9K	C4085	A	D	10G	C9125	B	C	21E				
C111	B	C	9K	C4086	A	D	10G	C9126	B	C	21E				
C112	B	C	9K	C4087	A	D	10G	C9127	B	C	21E				
C113	B	C	9K	C4088	A	D	10G	C9128	B	C	21E				
C114	B	C	9K	C4089	A	D	10G	C9129	B	C	21E				
C115	B	C	9K	C4090	A	D	10G	C9130	B	C	21E				
C116	B	C	9K	C4091	A	D	10G	C9131	B	C	21E				
C117	B	C	9K	C4092	A	D	10G	C9132	B	C	21E				
C118	B	C	9K	C4093	A	D	10G	C9133	B	C	21E				
C119	B	C	9K</												

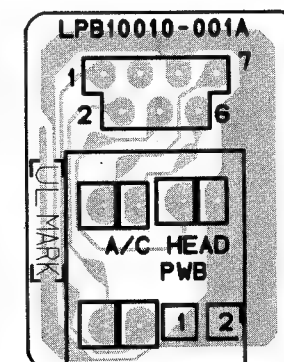


# 4.9 MAIN AND A/C HEAD CIRCUIT BOARDS

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).

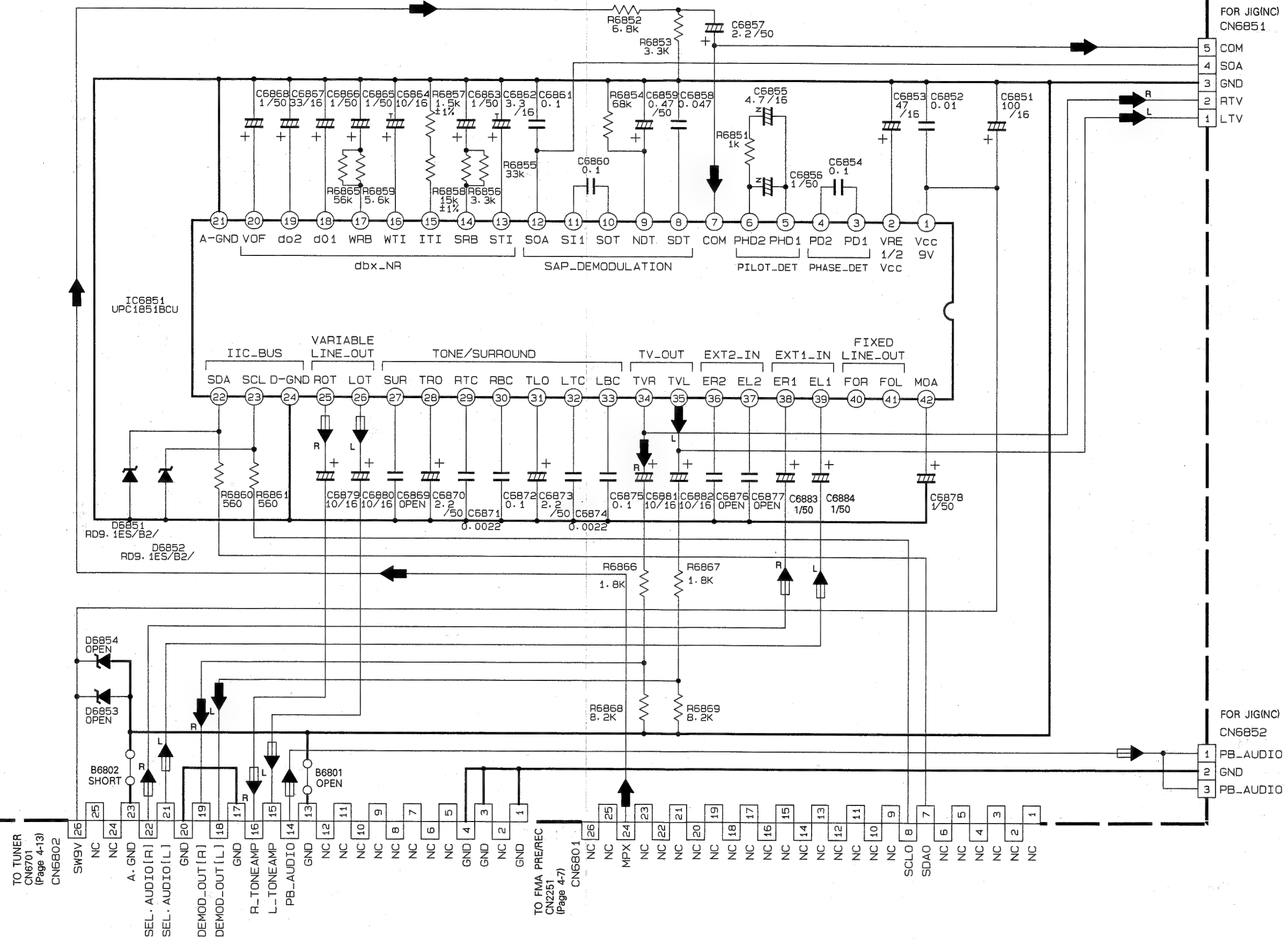


— A/C HEAD —



# 4.10 DEMODULATOR SCHEMATIC DIAGRAM

63 DEMOD



A

B

C

D 4-23

4-24

E

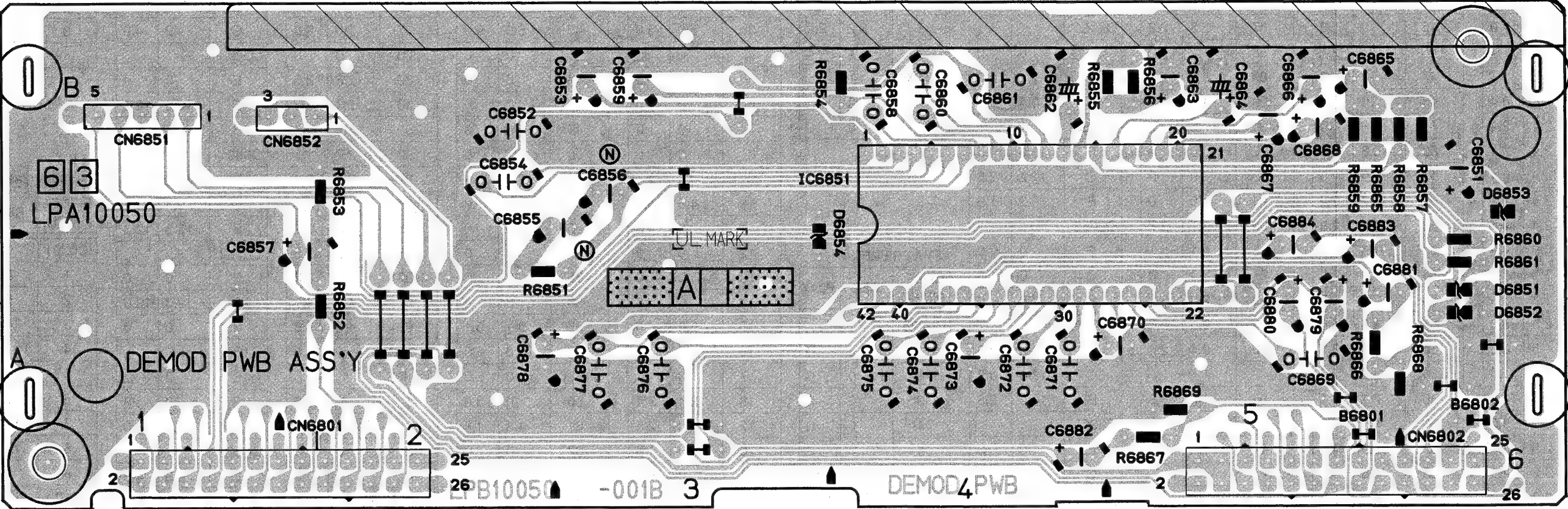
F

G

H



4.11 DEMODULATOR CIRCUIT BOARD



COMPONENT PARTS LOCATION GUIDE <DEMODULATOR>

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
CAPACITOR		C6864	A D 5B	C6878	A D 2A	DIODE		R6857	A D 6B
C6851	A D 6B	C6865	A D 5B	C6879	A D 5A	D6851	A D 6A	R6858	A D 6B
C6852	A D 2B	C6866	A D 5B	C6880	A D 5A	D6852	A D 6A	R6859	A D 5B
C6853	A D 3B	C6867	A D 5B	C6881	A D 5A	D6853	A D 6B	R6860	A D 6A
C6854	A D 2B	C6868	A D 5B	C6882	A D 4A	D6854	A D 3A	R6861	A D 6A
C6855	A D 2B	C6869	A D 5A	C6883	A D 5A	IC		R6865	A D 5B
C6856	A D 3B	C6870	A D 5A	C6884	A D 5A	IC6851	A D 4B	R6866	A D 5A
C6857	A D 2A	C6871	A D 4A	CONNECTOR		RESISTOR		R6867	A D 5A
C6858	A D 4B	C6872	A D 4A	CN6801	A D 1A	R6851	A D 2A	R6868	A D 6A
C6859	A D 3B	C6873	A D 4A	CN6802	A D 5A	R6852	A D 2A	R6869	A D 5A
C6860	A D 4B	C6874	A D 4A	CN6851	A D 1B	R6853	A D 2B		
C6861	A D 4B	C6875	A D 4A	CN6852	A D 2B	R6854	A D 4B		
C6862	A D 4B	C6876	A D 3A			R6855	A D 5B		
C6863	A D 5B	C6877	A D 3A			R6856	A D 5B		

4.12 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.4	2.4
2	2.4	2.4
3	0	0
4	2.6	2.4
5	0	0
6	0.4	0.4
7	2.4	2.4
8	2.4	2.4
9	2.4	2.4
10	2.4	2.4
11	2.4	2.4
12	4.9	4.9
13	1.8	1.5
14	1.8	1.5
15	2.5	3.0
16	1.5	0.8
17	0	1.8
18	2.4	2.0
19	3.0	3.0
20	2.6	2.6
21	2.2	2.2
22	2.3	2.0
23	2.9	2.9
24	2.1	2.1
25	1.4	1.4
26	2.0	2.0
27	0	0
28	2.9	2.9
29	1.8	1.8
30	2.7	2.7
31	2.7	2.7
32	0	0
33	0	0
34	0	0
35	3.2	3.2
36	5.1	5.1
37	4.9	4.9
38	5.1	5.1
39	3.2	3.2
40	5.1	5.1
41	5.1	5.1

MODE PIN NO.	REC	PLAY
42	2.1	2.1
43	5.1	5.1
44	2.6	2.6
45	0	0
46	2.1	2.1
47	0	0
48	0	0
49	0	0
50	0.3	0.3
51	0	0
52	2.2	2.2
53	2.8	2.8
54	1.9	1.9
55	2.0	2.0
56	2.7	2.7
57	4.9	4.9
58	3.2	3.2
59	3.5	3.5
60	2.1	2.1
61	4.9	4.9
62	4.9	4.9
63	4.8	4.8
64	0	0
65	0	0
66	4.9	4.9
67	4.9	4.9
68	0	0
69	2.7	2.7
70	2.6	2.6
71	-	-
72	2.2	2.2
73	-	-
74	2.6	1.0
75	0	0
76	2.3	2.3
77	0	0
78	2.7	2.7
79	3.9	2.0
80	0	0
81	2.5	2.5
82	1.1	1.1
83	2.3	2.3

MODE PIN NO.	REC	PLAY
84	0	2.6
85	0	0
86	2.1	2.1
87	2.2	2.2
88	2.2	2.2
89	2.1	2.1
90	4.9	4.9
91	0	0
92	0	0
93	0	0
94	0	0
95	2.7	2.7
96	5.1	5.1
97	0	0
98	2.0	2.3
99	0.5	2.6
100	2.4	2.4
Q9		
E	1.8	1.8
C	0	0
B	1.1	1.1
Q31		
E	0	0
C	0	0
B	0	0
Q40		
E	-	-
C	-	-
B	-	-
Q41		
E	-	-
C	-	-
B	-	-
Q2001		
E	-12.2	0
C	0	0
B	-18.7	0.6
Q2002		
E	-12.2	0
C	0	0
B	-18.5	0.6
Q2003		

MODE PIN NO.	REC	PLAY
E	5.1	5.1
C	-18.6	5.0
B	5.0	0
Q2051		
E	0	0
C	7.9	0.2
B	0.4	0.2
Q2052		
E	11.5	11.5
C	11.2	2.5
B	10.8	11.5
Q2053		
E	0	0
C	0	11.5
B	5.0	0
Q2054		
E	11.2	2.6
C	11.0	0.2
B	10.5	2.5
Q2055		
E	0	0
C	0	2.6
B	4.9	0
Q7251		
E	4.9	4.9
C	9.0	9.0
B	5.5	5.5
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.1	2.1
6	2.1	2.1
7	2.1	2.1
8	2.1	2.1
9	0	0
10	0	0
11	0	0
CN2001		
1	0	0
2	0	0

MODE PIN NO.	REC	PLAY
3	0	0
4	0	0
5	0	0
6	2.2	2.2
7	2.4	2.4
CN2002		
1	0	0
2	0	0

<FMA PRE/REC>

MODE PIN NO.	REC	PLAY
CN2251		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	4.5	4.5
8	4.5	4.5
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0.2
20	0	0
21	0	0
22	0	0
23	0	0
24	3.4	3.4
25	0	0
26	0	0

<SYSTEM CONTROL>

MODE PIN NO.	REC	PLAY
IC3001		
1	0	0
2	4.9	4.9
3	5.0	5.0
4	0	0
5	4.9	4.9
6	0	0
7	0	0
8	0	0
9	0	2.7
10	4.6	4.6
11	0	0
12	0	0
13	5.0	0
14	0	0
15	5.0	0
16	0	0
17	0	0
18	2.4	2.4
19	0	2.5
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	5.0	5.0
31	5.0	5.0
32	5.0	5.0
33	0	0
34	0	0
35	0	0
36	5.0	5.0
37	5.0	5.0
38	-	-
39	-	-
40	0	0
41	0	0

MODE PIN NO.	REC	PLAY
42	1.5	1.5
43	5.0	5.0
44	5.0	5.0
45	5.0	5.0
46	0	0
47	0	0
48	0	0
49	0	0
50	0	0
51	0	0
52	0	0
53	0	0
54	0	0
55	0	0
56	0	0
57	5.1	5.1
58	5.0	5.0
59	0	5.0
60	0	5.0
61	4.8	4.8
62	0	0
63	0	0
64	0	0
65	-	-
66	4.4	4.4
67	4.9	4.9
68	0	0
69	0.6	0.6
70	0	0
71	4.8	4.8
72	4.8	4.8
73	0	0
74	0	0
75	-	-
76	5.0	5.0
77	2.5	2.5
78	1.4	1.4
79	-	-
80	-	-
81	0	0
82	5.0	5.0
83	0	0

MODE PIN NO.	REC	PLAY
84	0.7	0.7
85	2.2	2.2
86	0.6	0.6
87	2.0	2.0
88	0	0
89	2.3	2.3
90	2.3	2.3
91	1.8	2.3
92	2.7	2.3
93	2.3	2.3
94	2.2	2.2
95	2.2	2.2
96	2.3	2.3
97	2.2	2.2
98	4.6	4.6
99	4.6	4.6
100	5.0	5.0
IC3002		
1	0	0
2	12.3	12.3
3	0	0
4	0	0
5	0	0
6	12.3	12.3
7	0	0
8	12.3	12.3
9	0	0
IC3003		
1	5.0	5.0
2	5.0	5.0
3	0	0
IC3004		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.8	4.8
6	4.9	4.9
7	0	0
8	5.0	5.0
Q3001		
E	0	0

MODE PIN NO.	REC	PLAY
C	4.8	4.8
Q3002		
E	0	0
C	4.9	4.9
Q3003		
E	0	0
C	12.3	12.3
B	0	0
Q3801		
E	12.3	12.3
C	9.4	9.4
B	12.3	12.3
Q3802		
E	0	0
C	12.3	12.3
B	0	0
Q4001		
E	0	0
C	0	0
B	5.0	5.0
Q4002		
E	4.6	4.6
C	5.7	5.7
B	5.3	5.3
CN3001		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.1	5.1
5	0	0
6	5.0	5.0
7	0	0
8	9.4	9.4
CN3002		
1	1.5	1.5
2	0.5	0.5
3	12.3	12.3
4	2.0	2.0
5	0	0
CN3003		
1	0	0
2	0	0

MODE PIN NO.	REC	PLAY
CN3004		
1	5.0	5.0
2	5.0	5.0
3	0	0
4	0	0

<SWITCHING REGULATOR>

MODE PIN NO.	REC	PLAY
IC5301		
1	5.9	5.9
2	5.1	5.1
3	4.8	4.8
4	0	0
5	12.3	12.3
6	11.6	11.6
7	12.3	12.3
8	12.3	12.3
9	1.2	1.2
10	11.1	11.1
Q5101		
S	-	-
D	95.6	93.0
G	-	-
Q5102		
E	0	0
C	-	-
B	-	-

<TUNER>

MODE PIN NO.	REC	PLAY
IC6650		
1	4.5	4.5
2	4.5	4.5
3	4.4	4.4

MODE PIN NO.	REC	PLAY
4	0	0
5	4.3	4.3
6	5.8	5.8
7	1.3	1.3
8	9.1	9.1
Q6001		
E	9.1	9.1
C	11.5	11.5
B	9.7	9.7
Q6030		
E	3.2	3.2
C	0	0
B	2.5	2.5
Q6031		
E	0	0
C	10.5	10.5
B	0	0
Q6701		
E	9.0	9.0
C	12.3	12.3
B	9.5	9.5
Q6702		
E	12.3	12.3
C	12.3	12.3
B	0.6	0.6
Q6703		
E	0	0
C	9.6	9.6
B	0.5	0.5
Q6706		
E	0	0
C	0	0
B	4.1	4.1
CN6701		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0

<FRONT>

MODE PIN NO.	REC	PLAY
IC7201		
1	4.6	4.6
2	5.0	5.0
3	0	0
Q7201		
E	0	0
C	1.7	1.7
B	0	0
Q7202		
E	0	0
C	5.0	5.0
B	0	0
Q7203		

MODE PIN NO.	REC	PLAY
E	1.7	0.1
C	1.8	5.1
B	2.4	0

<TV BLOCK>

MODE PIN NO.	REC	PLAY
IC9001		
1	-	-
2	4.9	4.9
3	5.1	5.1
4	4.2	4.2
5	0	0
6	0	0
7	5.6	5.6
8	0	0
9	0	4.2
10	4.2	4.2
11	5.0	5.0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0.6	0.6
18	4.5	4.5
19	0	0
20	0	0
21	0	0
22	0	0
23	5.1	5.1
24	-	-
25	4.4	4.4
26	4.9	4.9
27	4.8	4.8
28	-	-
29	0	4.8
30	0	0

MODE PIN NO.	REC	PLAY
31	0	0
32	0	0
33	5.0	5.0
34	0	0
35	5.0	5.0
36	0	0
37	4.4	4.4
38	5.0	5.0
39	0	0
40	0	0
41	0	0
42	5.0	0
43	5.0	5.0
44	2.5	2.5
45	0	0
46	2.4	2.4
47	0.8	0.8
48	0	0
49	5.0	5.0
50	5.0	5.0
51	5.0	5.0
52	5.0	5.0
53	5.0	5.0
54	5.0	5.0
55	5.1	5.1
56	4.6	4.6
57	0	0
58	-	-
59	-	-
60	5.1	5.1
61	4.9	4.9
62	4.9	4.9
63	5.1	5.1
64	5.1	5.1
IC9002		
1	0	0
2	0	0
3	0	0
4	0	0
5	5.0	5.0
6	5.0	5.0
7	0	0

MODE PIN NO.	REC	PLAY
8	5.0	5.0
IC9003		
1	5.0	5.0
2	5.0	5.0
3	0	0
IC9601		
1	2.5	2.5
2	9.0	9.0
3	3.3	3.3
4	0	0
5	3.2	3.2
6	0	0
7	3.2	3.2
8	0	0
9	2.5	2.5
10	3.2	3.2
11	3.2	3.2
12	3.2	3.2
13	3.9	3.9
14	4.1	4.1
15	4.5	0
16	3.2	3.2
17	3.2	3.2
18	3.2	3.2
IC9621		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
Q9001		
E	0	0
C	5.0	5.0
B	0	0
Q9003		
E	5.0	5.0
C	5.0	5.0

MODE PIN NO.	REC	PLAY
B	0	0
Q9004		
E	0	0
C	5.0	5.0
B	0	0
Q9005		
E	5.0	5.0
C	4.9	4.9
B	0	0
Q9007		
E	0	0
C	4.5	4.5
B	0	0
Q9601		
E	0	0
C	4.5	4.5
B	0	4.3
Q9602		
E	0	0
C	0	0
B	4.2	0
Q9603		
E	2.5	2.5
C	0	0
B	1.9	1.9
Q9621		
E	0	0
C	0	0
B	0	0
Q9622		
E	0	0
C	0	0
B	0	0
Q9623		
E	0	0
C	0	0
B	0	0
Q9624		
E	0	0
C	0	0
B	0	0
Q9625		

MODE PIN NO.	REC	PLAY
E	8.4	8.4
C	0	0
B	8.8	8.8
Q9626		
E	0	0
C	8.9	8.9
B	0	0
CN9601		
1	31.8	31.8
2	9.0	9.0
3	0	0
4	0	0
5	-	-
6	0	0
7	2.5	2.5
8	0	0
9	1.2	1.2
10	0	0
11	5.0	5.0
12	5.0	5.0
13	0	0
14	4.9	4.9
15	4.9	4.9
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	5.0	5.0
CN9602		
1	0	0
2	0	0
3	0	0
CN9603		
1	0	0
2	0	0
3	0	0

<DEMODULATOR>

MODE PIN NO.	REC	PLAY
IC6851		
1	8.9	8.9
2	4.4	4.4
3	4.4	4.4
4	4.4	4.4
5	4.5	4.5
6	4.5	4.5
7	4.4	4.4
8	6.0	6.0
9	1.9	1.9
10	3.4	3.4
11	4.4	4.4
12	4.4	4.4
13	5.1	5.1
14	4.5	4.5
15	1.2	1.2
16	5.1	5.1
17	4.1	4.1
18	4.2	4.2
19	1.5	1.5
20	4.4	4.4
21	0	0
22	4.5	4.5
23	4.4	4.4
24	0	0
25	4.5	4.5
26	4.5	4.5
27	4.5	4.5
28	4.5	4.5
29	4.5	4.5
30	4.5	4.5
31	4.5	4.5
32	4.5	4.5
33	4.5	4.5
34	4.5	4.5
35	4.5	4.5
36	4.4	4.4
37	4.4	4.4
38	4.4	4.4
39	4.4	4.4
40	4.5	4.5
41	4.5	4.5

MODE PIN NO.	REC	PLAY
42	4.1	4.1
CN6801		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	4.5	4.5
8	4.5	4.5
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0.2
20	0	0
21	0	0
22	0	0
23	0	0
24	3.4	3.4
25	0	0
26	0	0
CN6802		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0

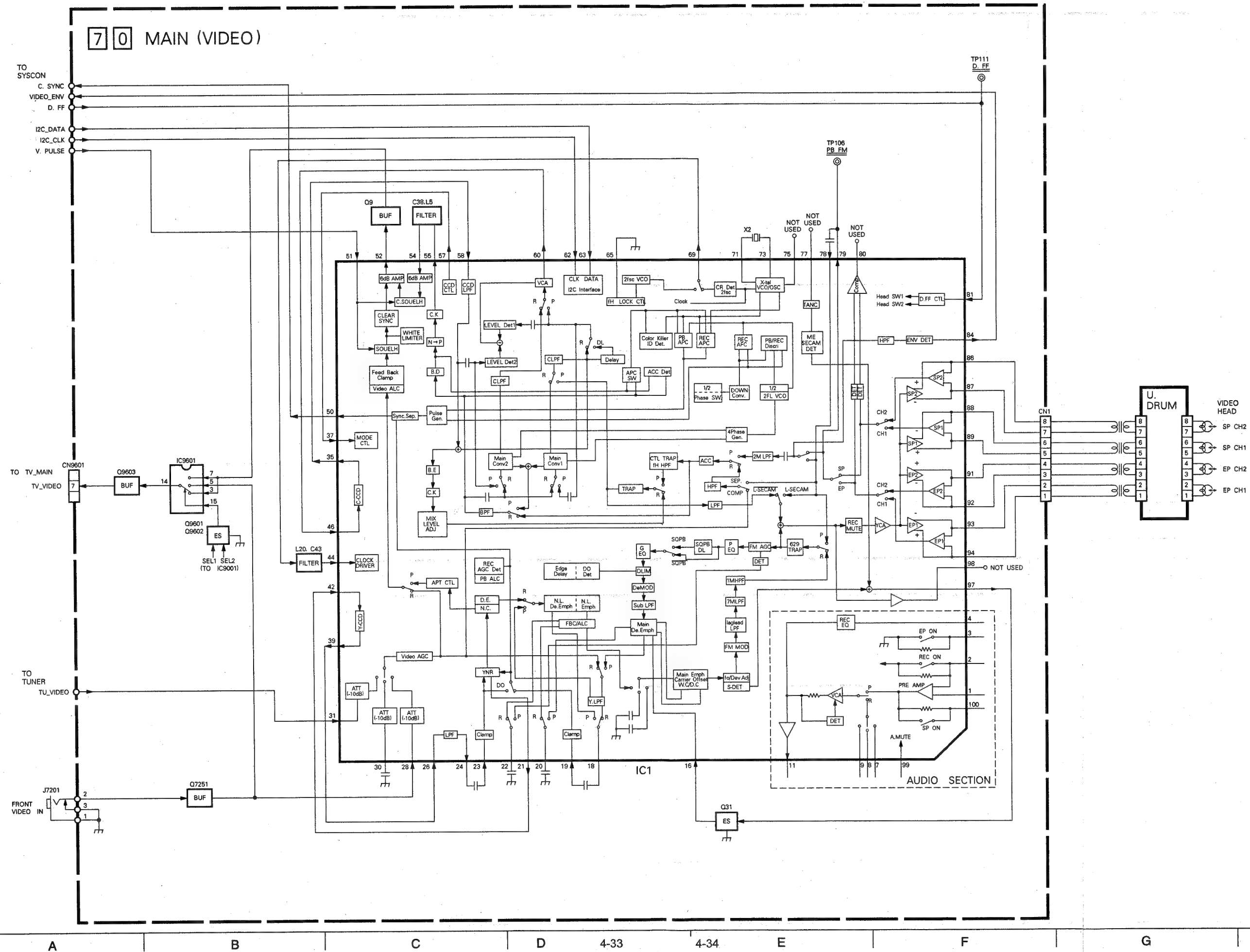
MODE PIN NO.	REC	PLAY
14	0	0
15	3.1	3.1
16	4.1	4.1
17	0	0
18	3.0	3.0
19	3.4	3.4
20	0	0
21	2.7	2.7
22	2.5	2.5
23	0	0
24	0	0
25	0	0
26	0	0
CN6851		
1	4.5	4.5
2	4.5	4.5
3	0	0
4	4.4	4.4
5	4.4	4.4
CN6852		
1	0	0
2	0	0
3	0	0



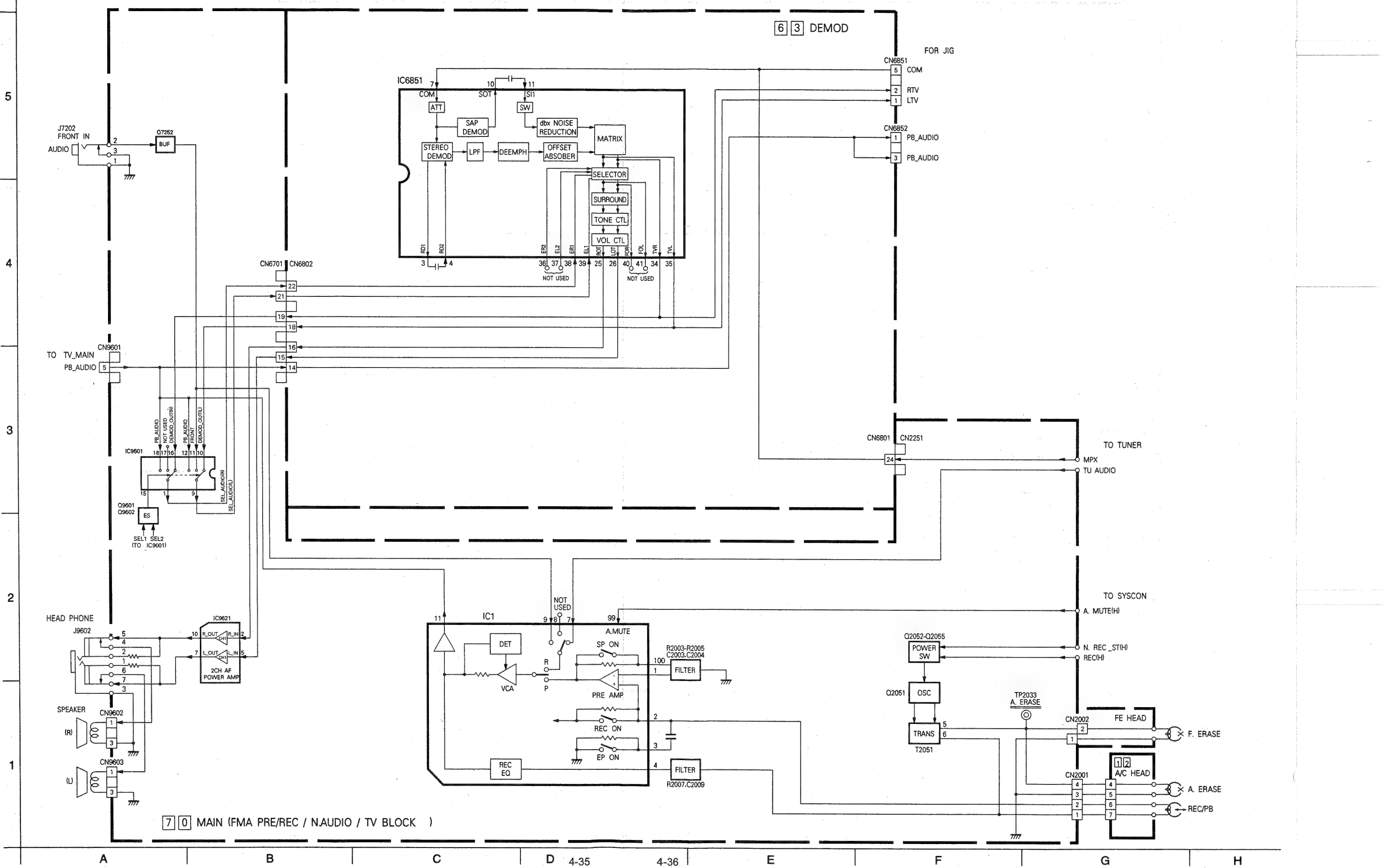
## 4-31



#### 4.14 VIDEO BLOCK DIAGRAM



4.15 AUDIO BLOCK DIAGRAM



# CHANNEL CHART [US]

MODE		BAND	CHANNEL		TUNER BAND
TV	CATV		REAL	DISP.	
○	○	VL	02		I
			03		
			04		
			05		
			06		
		VH	07		II
			08		
			09		
			10		
			11		
			12		
			13		
x	○	MID	A	14	I
			B	15	
			C	16	
			D	17	
			E	18	
			F	19	
			G	20	
			H	21	
			I	22	
		SUPER	J	23	II
			K	24	
			L	25	
			M	26	
			N	27	
			O	28	
			P	29	
			Q	30	
			R	31	
			S	32	
			T	33	
			U	34	
			V	35	
			W	36	
		HYPER	W+1	37	IV
			W+2	38	
			W+3	39	
			W+4	40	
			W+5	41	
			W+6	42	
			W+7	43	
			W+8	44	
			W+9	45	
			W+10	46	
			W+11	47	
			W+12	48	
			W+13	49	
			W+14	50	
			W+15	51	
			W+16	52	
			W+17	53	
			W+18	54	
			W+19	55	
			W+20	56	
		ULTRA	W+21	57	
			W+22	58	
			W+23	59	
			W+24	60	
			W+25	61	
			W+26	62	
			W+27	63	
			W+28	64	
			W+29	65	
			W+30	66	
			W+31	67	
			W+32	68	
			W+33	69	
			W+34	70	

MODE		BAND	CHANNEL		TUNER BAND
TV	CATV		REAL	DISP.	
x	○	ULTRA	W+35	71	IV
			W+36	72	
			W+37	73	
			W+38	74	
			W+39	75	
			W+40	76	
			W+41	77	
			W+42	78	
			W+43	79	
			W+44	80	
			W+45	81	
			W+46	82	
			W+47	83	
			W+48	84	
			W+49	85	
			W+50	86	
			W+51	87	
			W+52	88	
			W+53	89	
			W+54	90	
			W+55	91	
			W+56	92	
			W+57	93	
			W+58	94	
		W+59	100		
		W+60	101		
		W+61	102		
		W+62	103		
		W+63	104		
		W+64	105		
		W+65	106		
		W+66	107		
		W+67	108		
		W+68	109		
W+69	110				
W+70	111				
W+71	112				
W+72	113				
W+73	114				
W+74	115				
W+75	116				
W+76	117				
W+77	118				
W+78	119				
W+79	120				
W+80	121				
W+81	122				
W+82	123				
W+83	124				
W+84	125				
SUB MID	A-8	01	I		
	A-4	96			
	A-3	97			
	A-2	98			
	A-1	99			
○	x	UHF	14 5 69	IV	
TOTAL 180CH { VHF 124CH { UHF 56CH					
NOTE: TO RECEIVE THE SUBSCRIPTION OR PREMIUM PROGRAMMING FROM CERTAIN CABLE COMPANIES. SPECIAL ADAPTERS MAY BE REQUIRED.					

CHANNEL CHART [CA]

MODE		BAND	CHANNEL		TUNER BAND
TV	CATV		REAL	DISP.	
○	○	VL	02		I
			03		
			04		
			05		
			06		
		VH	07		II
			08		
			09		
			10		
			11		
			12		
			13		
		MID	A	14	
			B	15	
			C	16	
			D	17	
			E	18	
			F	19	
			G	20	
			H	21	
			I	22	
x	○	SUPER	J	23	II
			K	24	
			L	25	
			M	26	
			N	27	
			O	28	
			P	29	
			Q	30	
		HYPER	R	31	III
			S	32	
			T	33	
			U	34	
			V	35	
			W	36	
			W+1	37	
			W+2	38	
			W+3	39	
			W+4	40	
			W+5	41	
			W+6	42	
			W+7	43	
			W+8	44	
			W+9	45	
			W+10	46	
			W+11	47	
			W+12	48	
			W+13	49	
			W+14	50	
			W+15	51	
			W+16	52	
			W+17	53	
			W+18	54	
			W+19	55	
			W+20	56	
			W+21	57	
			W+22	58	
			W+23	59	
			W+24	60	
			W+25	61	
			W+26	62	
			W+27	63	
			W+28	64	
		ULTRA	W+29	65	IV
			W+30	66	
			W+31	67	
			W+32	68	
			W+33	69	
			W+34	70	

MODE		BAND	CHANNEL		TUNER BAND	
TV	CATV		REAL	DISP.		
x	○	ULTRA	W+35	71	IV	
			W+36	72		
			W+37	73		
			W+38	74		
			W+39	75		
			W+40	76		
			W+41	77		
			W+42	78		
			W+43	79		
			W+44	80		
			W+45	81		
			W+46	82		
			W+47	83		
			W+48	84		
			W+49	85		
			W+50	86		
			W+51	87		
			W+52	88		
			W+53	89		
			W+54	90		
			W+55	91		
			W+56	92		
			W+57	93		
			W+58	94		
		W+59	100			
		W+60	101			
		W+61	102			
		W+62	103			
		W+63	104			
		W+64	105			
		W+65	106			
		W+66	107			
		W+67	108			
		W+68	109			
		W+69	110			
		W+70	111			
W+71	112					
W+72	113					
W+73	114					
W+74	115					
W+75	116					
W+76	117					
W+77	118					
W+78	119					
W+79	120					
W+80	121					
W+81	122					
W+82	123					
W+83	124					
W+84	125					
		SUB MID	A-8	01	I	
			A-4	96		
				A-3	97	II
				A-2	98	
			A-1	99		
○	x	UHF	14 5 69		IV	
TOTAL 180CH { VHF 124CH { UHF 56CH						
NOTE: TO RECEIVE THE SUBSCRIPTION OR PREMIUM PROGRAMMING FROM CERTAIN CABLE COMPANIES. SPECIAL ADAPTERS MAY BE REQUIRED.						

# PARTS LIST

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# PARTS LIST(TV)

## CAUTION

- The parts identified by the  $\triangle$  symbol are important for the safety. Whenever replacing these parts, be sure to use specified ones to secure the safety.
- The parts not indicated in this Parts List and those which are filled with lines — in the Parts No. columns will not be supplied.
- P. W. Board Ass'y will not be supplied, but those which are filled with the Parts No. in the Parts No. columns will be supplied.

## ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
C R	Carbon Resistor	C CAP.	Ceramic Capacitor
F R	Fusible Resistor	E CAP.	Electrolytic Capacitor
P R	Plate Resistor	M CAP.	Mylar Capacitor
V R	Variable Resistor	HV CAP.	High Voltage Capacitor
HV R	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MF R	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MG R	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MP R	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OM R	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMF R	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNF R	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH V R	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CH MG R	Chip Metal Glazed Resistor	CH C CAP.	Chip Ceramic Capacitor
COMP. R	Composition Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
		CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Tantalum Bi-Polar Electrolytic Capacitor

TOLERANCES									
F	G	J	K	M	N	R	H	Z	P
±1%	±2%	±5%	±10%	±20%	±30%	+30% -10%	+50% -10%	+80% -20%	+100% -0%

# USING PW BOARD & REMOTE CONTROL UNIT

PWB ASS'Y	Model	TV-20240(US)	TV-20240(CA)
MAIN PWB		SFC-1001A-H2	←
CRT SOCKET PWB		SFC-3001A-H2	←
REMOTE CONTROL UNIT		RM-C139-1C	←

## REMOTE CONTROL UNIT PARTS LIST (RM-C139-1C)

△ Ref.No.	Part No.	Part Name	Description	Local
	2AA023600	BATTERY COVER		



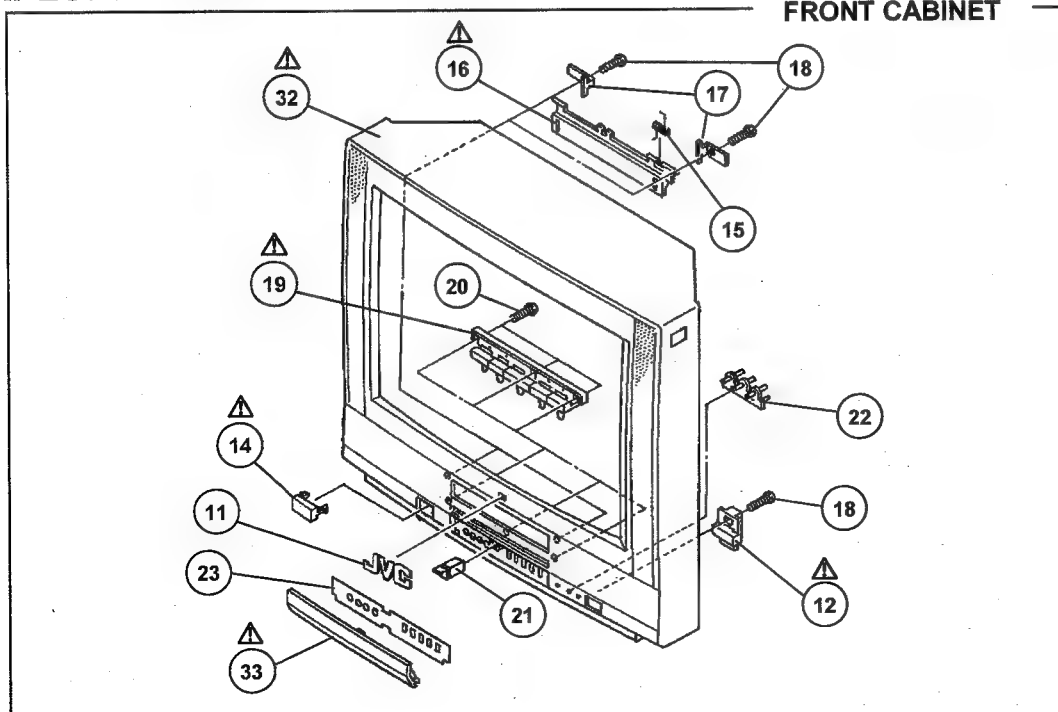
## TV-20240(US) / TV-20240(CA)

## EXPLODED VIEW PARTS LIST

△ Ref.No.	Part No.	Part Name	Description	Local
△ V01	A51LQC061X	PICTURE TUBE(C)		
△ L01	CELD041-003J6	DEGAUSSING COIL		
△ DY01	QOD0025-001	DEF YOKE		
△ T1522	QOH0047-001	FBT		
1	A48457-3-H	SPRING		
2	CHGB0016-0B-FH	BRAIDED WIRE		
△ 4	CE42153-00AJ1	WEDGE	×3	
△ 5	A75034-B	P.C.MAGNET		
6	QAS0022-001	SPEAKER	×2 (SP01, SP02)	
7	WJJ0055-001A	E-SI C WIR C-C	×2	
8	LC40401-001A	FCC LABEL	ONLY TV-20240(US)	
9	CHGY0031-0C	ANT CABLE ASSY		
10	SBSF4012Z-H	TAPPING SCREW	×8 For SPEAKER	
11	CM43094-008-H	JVC MARK		
△ 12	LC30491-002B-H	POWER KNOB		
13	CHFB125-08BD	FFC WIRE		
△ 14	LC30490-001B-H	SENSOR PANEL		
15	LC40335-001A-H	SPRING		
△ 16	LC20197-003B-H	CASSETTE FLAP		
17	CM48252-001-H	FLAP BRACKET	×2	
18	SBSF3010Z-H	TAPPING SCREW	×3	
△ 19	LC20198-003B-H	VTR KNOB		
20	SBSF3010Z-H	TAPPING SCREW	×3 For VTR KNOB	
21	QZW0020-001	DOOR LATCH		
22	LC30492-001A-H	L.E.D.LENS		
23	LC30495-006A-H	OPERATION SHEET		
△ 24	LC10256-002B-H	REAR COVER		
25	GBSF4016Z-H	TAPPING SCREW	×9	
△ 26	CM36617-002-VH	BACK BOARD		
28	LC30668-003A-H	SPEAKER BRACKET	×2	
△ 29	QMPD210-200-JC	POWER CORD		
30	LP20324-002D	DOOR OPENER		
31	SBSF3010Z-H	TAPPING SCREW		
△ 32	LC10255-003C-H	FRONT CABINET		
△ 33	LC20199-003C-H	DOOR		
34	CEGA012-001	ANT.SPLITTER		
△ 35	LC20106-001B-A	POWER CORD CLAMP		
△ 36	CM22907-002-H	RATING LABEL	TV-20240(US)	
△ 36	CM22874-001-H	RATING LABEL	TV-20240(CA)	

## EXPLODED VIEW I

## FRONT CABINET



## USING PW BOARD & REMOTE CONTROL UNIT

PWB ASS'Y \ Model	TV-20240(US)	TV-20240(CA)
MAIN PWB	SFC-1001A-H2	←
CRT SOCKET PWB	SFC-3001A-H2	←
REMOTE CONTROL UNIT	RM-C139-1C	←

## REMOTE CONTROL UNIT PARTS LIST (RM-C139-1C)

△ Ref. No.	Part No.	Part Name	Description	Local
	2AA023600	BATTERY COVER		

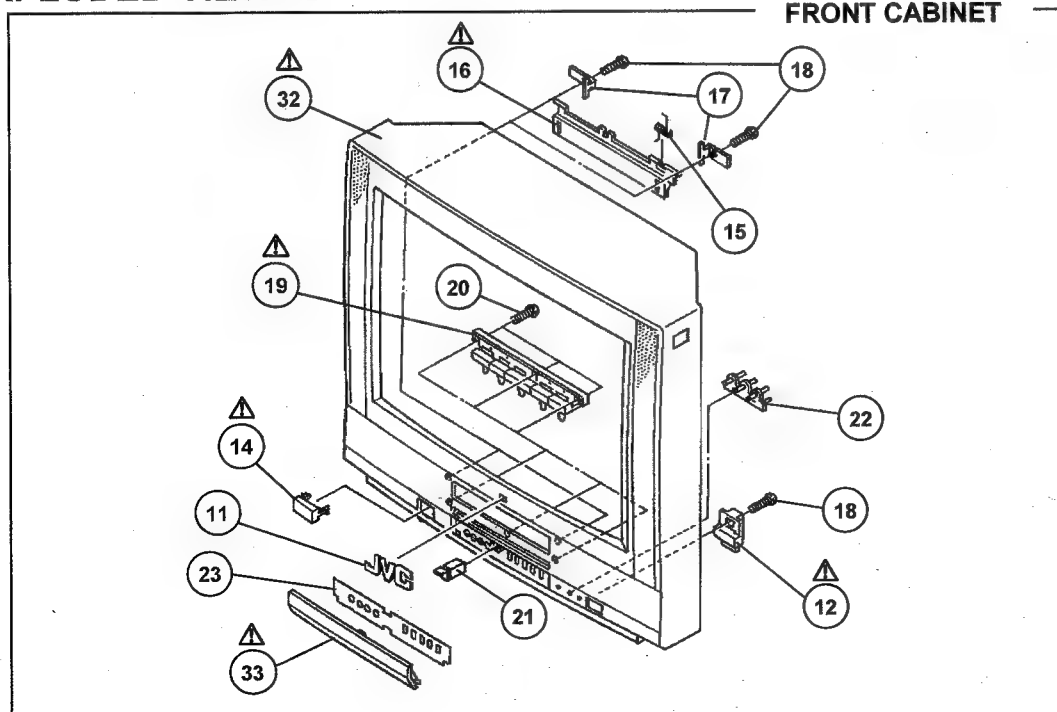
## TV-20240(US) / TV-20240(CA)

## EXPLODED VIEW PARTS LIST

△ Ref.No.	Part No.	Part Name	Description	Local
△ V01	A51LQC061X	PICTURE TUBE(C)		
△ L01	CELD041-003J6	DEGAUSSING COIL		
△ DY01	QOD0025-001	DEF YOKE		
△ T1522	QOH0047-001	FBT		
1	A48457-3-H	SPRING		
2	CHGB0016-0B-FH	BRAIDED WIRE		
△ 4	CE42153-00AJ1	WEDGE	×3	
△ 5	A75034-B	P.C.MAGNET		
6	QAS0022-001	SPEAKER	×2(SP01,SP02)	
7	WJJ0055-001A	E-SI C WIR C-C	×2	
8	LC40401-001A	FCC LABEL	ONLY TV-20240(US)	
9	CHGY0031-0C	ANT CABLE ASSY		
10	SBSF4012Z-H	TAPPING SCREW	×8 For SPEAKER	
11	CM43094-008-H	JVC MARK		
△ 12	LC30491-002B-H	POWER KNOB		
13	CHFB125-08BD	FFC WIRE		
△ 14	LC30490-001B-H	SENSOR PANEL		
15	LC40335-001A-H	SPRING		
△ 16	LC20197-003B-H	CASSETTE FLAP		
17	CM48252-001-H	FLAP BRACKET	×2	
18	SBSF3010Z-H	TAPPING SCREW	×3	
△ 19	LC20198-003B-H	VTR KNOB		
20	SBSF3010Z-H	TAPPING SCREW	×3 For VTR KNOB	
21	QZW0020-001	DOOR LATCH		
22	LC30492-001A-H	L.E.D.LENS		
23	LC30495-006A-H	OPERATION SHEET		
△ 24	LC10256-002B-H	REAR COVER		
25	GBSF4016Z-H	TAPPING SCREW	×9	
△ 26	CM36617-002-VH	BACK BOARD		
28	LC30668-003A-H	SPEAKER BRACKET	×2	
△ 29	QMPD210-200-JC	POWER CORD		
30	LP20324-002D	DOOR OPENER		
31	SBSF3010Z-H	TAPPING SCREW		
△ 32	LC10255-003C-H	FRONT CABINET		
△ 33	LC20199-003C-H	DOOR		
34	CEGA012-001	ANT.SPLITTER		
△ 35	LC20106-001B-A	POWER CORD CLAMP		
△ 36	CM22907-002-H	RATING LABEL	TV-20240(US)	
△ 36	CM22874-001-H	RATING LABEL	TV-20240(CA)	

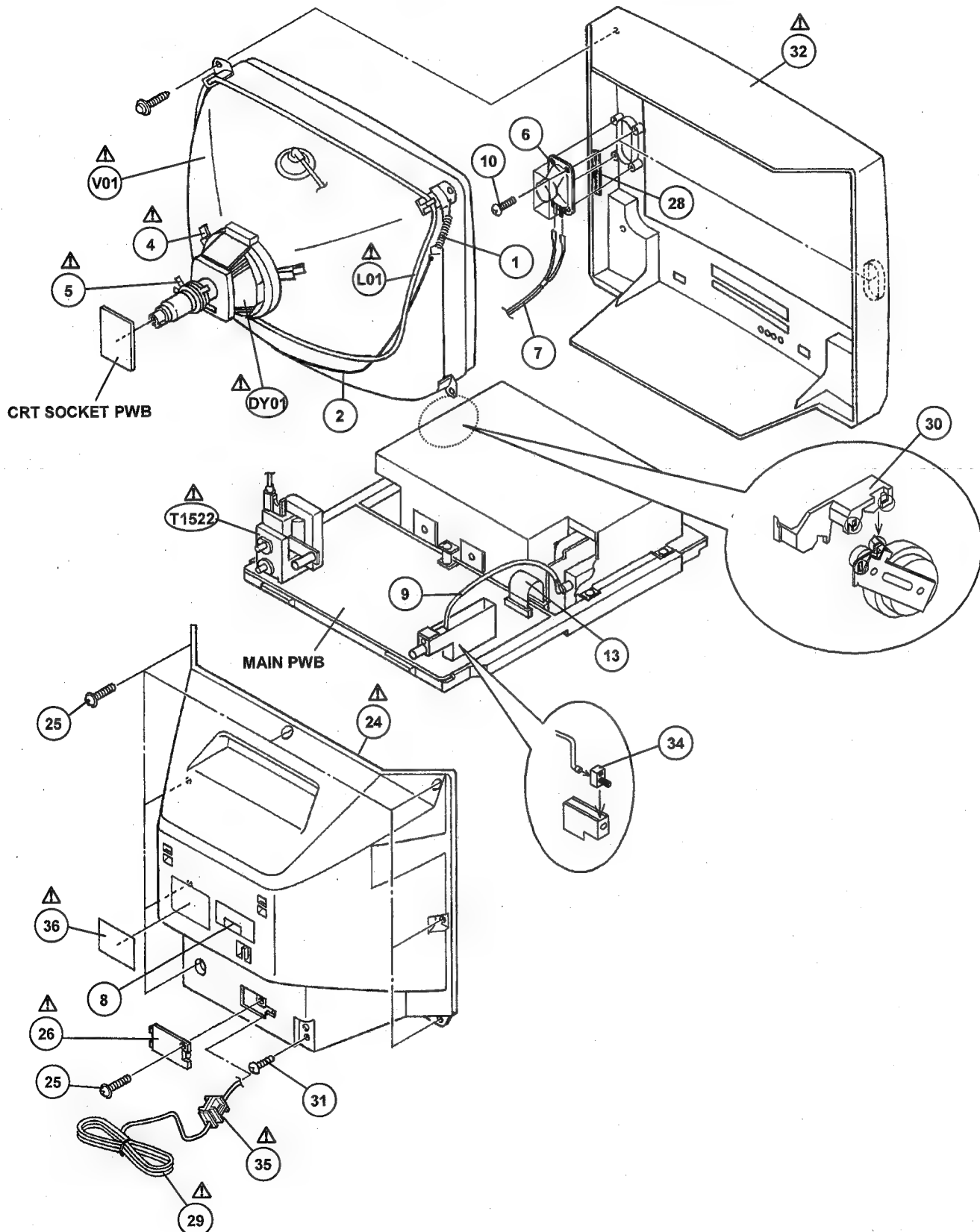
## EXPLODED VIEW I

## FRONT CABINET



TV-20240<sub>(US)</sub> / TV-20240<sub>(CA)</sub>

## EXPLODED VIEW II



## TV-20240(US) / TV-20240(CA)

## PRINTED WIRING BOARD PARTS LIST

## MAIN P.W. BOARD ASS'Y (SFC-1001A-H2)

Symbol No.	Part No.	Part Name	Description	Local
<b>RESISTOR</b>				
R1107	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1162	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1201	NRSA02J-471X	MG R	470Ω 1/10W J	
R1202	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1204	QRK126J-332X	C R	3.3kΩ 1/2W J	
R1205	NRSA02J-272X	MG R	2.7kΩ 1/10W J	
R1209	NRSA02J-183X	MG R	18kΩ 1/10W J	
R1210	NRSA02J-221X	MG R	220Ω 1/10W J	
R1211	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1212	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1213	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1214	NRSA02J-681X	MG R	680Ω 1/10W J	
R1215	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1218	NRSA02J-224X	MG R	220kΩ 1/10W J	
R1220	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1221	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1224	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1225	NRSA02J-681X	MG R	680Ω 1/10W J	
R1226	NRSA02J-332X	MG R	3.3kΩ 1/10W J	
R1301	NRSA02J-821X	MG R	820Ω 1/10W J	
R1305	NRSA02J-221X	MG R	220Ω 1/10W J	
R1306	NRSA02J-332X	MG R	3.3kΩ 1/10W J	
R1307	NRSA02J-393X	MG R	39kΩ 1/10W J	
R1308	NRSA02J-183X	MG R	18kΩ 1/10W J	
R1309	NRSA02J-331X	MG R	330Ω 1/10W J	
R1421	NRSA02J-472X	MG R	4.7kΩ 1/10W J	
R1422	QRE121J-391Y	C R	390Ω 1/2W J	
R1423	QRX01GJ-1R5	MF R	1.5Ω 1W J	
R1425	NRSA02J-683X	MG R	68kΩ 1/10W J	
R1427	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1428	NRSA02J-393X	MG R	39kΩ 1/10W J	
R1429	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1430-31	NRSA02J-OROX	MG R	0.0Ω 1/10W J	
R1433	QRE121J-6R8Y	C R	6.8Ω 1/2W J	
R1441	QRE121J-102Y	C R	1kΩ 1/2W J	
R1501	NRSA02J-361X	MG R	360Ω 1/10W J	
R1502	NRSA02J-152X	MG R	1.5kΩ 1/10W J	
R1504	NRSA02J-OROX	MG R	0.0Ω 1/10W J	
R1505	NRSA02J-822X	MG R	8.2kΩ 1/10W J	
R1506	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1507	NRSA02J-563X	MG R	56kΩ 1/10W J	
R1509	QRT029J-2R7	MF R	2.2Ω 2W J	
R1511	QRE121J-391Y	C R	390Ω 1/2W J	
R1512	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1513	QRE121J-392Y	C R	3.9kΩ 1/2W J	
R1514	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1522	NRSA02J-391X	MG R	390Ω 1/10W J	
R1523	NRSA02J-471X	MG R	470Ω 1/10W J	
R1524	QRE121J-271Y	C R	270Ω 1/2W J	
R1525	QRG029J-101	OM R	100Ω 2W J	
R1526	QRL039J-152	OM R	1.5kΩ 3W J	
R1530	QRG01GJ-681	OM R	680Ω 1W J	
R1546	QRL029J-221	OM R	220Ω 2W J	
Δ R1562	NRZ0032-7151X	M.F. RESISTOR	7.15kΩ 1/10W±0.5%	
Δ R1563	NRZ0032-3241X	CHIP MF RESISTOR	3.24kΩ 1/10W±0.5%	
R1564	NRSA02J-153X	MG R	15kΩ 1/10W J	
R1565	NRSA02J-OROX	MG R	0.0Ω 1/10W J	
R1566	NRSA02J-333X	MG R	33kΩ 1/10W J	
R1567	NRSA02J-392X	MG R	3.9kΩ 1/10W J	
R1568	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1570	NRSA02J-102X	MG R	1kΩ 1/10W J	
R1583-84	QRE121J-473Y	C R	47kΩ 1/2W J	
R1585-86	QRE121J-472Y	C R	4.7kΩ 1/2W J	
R1588	NRSA02J-OROX	MG R	0.0Ω 1/10W J	

Symbol No.	Part No.	Part Name	Description	Local
<b>RESISTOR</b>				
R1589	NRSA02J-123X	MG R	12kΩ 1/10W J	
R1603	QRT029J-2R7	MF R	2.7Ω 2W J	
R1701	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1705	NRSA02J-473X	MG R	47kΩ 1/10W J	
R1706	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1707	NRSA02J-OROX	MG R	0.0Ω 1/10W J	
R1709	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1713	NRSA02J-103X	MG R	10kΩ 1/10W J	
R1740-41	NRSA02J-OROX	MG R	0.0Ω 1/10W J	
R1804-06	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
R1807-09	NRSA02J-101X	MG R	100Ω 1/10W J	
Δ R1901	QRF054K-1R0	UNF R	1Ω 5W K	
R1921	QRT029J-2R7	MF R	2.7Ω 2W J	
R1923	QRJ146J-470X	C R	47Ω 1/4W J	
R1924	QRE121J-334Y	C R	330kΩ 1/2W J	
R1925	QRE121J-123Y	C R	12kΩ 1/2W J	
R1927	QRF204J-271	UNF R	270Ω 20W J	
R1952	NRSA02J-223X	MG R	22kΩ 1/10W J	
R1953	NRSA02J-222X	MG R	2.2kΩ 1/10W J	
Δ R1981	QRZ9046-275Z	C RESISTOR	2.7MΩ 1/2W±10%	

## CAPACITOR

C1107	NRSA02J-OROX	MG R	0.0Ω 1/10W J
C1207	QENC1HM-474Z	BP E CAP.	0.47μF 50V M
C1208	QETN1HM-106Z	E CAP.	10μF 50V M
C1209-10	NCB11CK-105X	C CAP.	1μF 16V K
C1214	QETN1HM-106Z	E CAP.	10μF 50V M
C1216	QETN1CM-476Z	E CAP.	47μF 16V M
C1256	QENC1HM-105Z	BP E CAP.	1μF 50V M
C1257	NCB21HK-103X	C CAP.	0.01μF 50V K
C1303	QFLC1HJ-104Z	M CAP.	0.1μF 50V J
C1304	QETN1CM-107Z	E CAP.	100μF 16V M
C1305	NDC21HJ-100X	C CAP.	10pF 50V J
C1306	QFLC1HJ-223Z	M CAP.	0.022μF 50V J
C1307	QETN1HM-474Z	E CAP.	0.47μF 50V M
C1308	NDC21HJ-151X	C CAP.	150pF 50V J
C1401	QETN1HM-225Z	E CAP.	2.2μF 50V M
C1402	QBTC1CK-225Z	TAN. CAP.	2.2μF 16V K
C1403	NCB21HK-102X	C CAP.	1000pF 50V K
C1421	QFLC1HJ-103Z	M CAP.	0.01μF 50V J
C1423	QCS32HJ-180Z	C CAP.	18pF 500V J
C1424	QEHRIVM-107Z	E CAP.	100μF 35V M
C1426	QFLC2AK-104Z	M CAP.	0.1μF 100V K
C1427	QEHQ1EM-228	E CAP.	2200μF 25V M
C1428	QFV71HJ-474Z	MF CAP.	0.47μF 50V J
C1429	QFV71HJ-224Z	MF CAP.	0.22μF 50V J
C1501	QETN1CM-477Z	E CAP.	470μF 16V M
C1502	QETN1HM-106Z	E CAP.	10μF 50V M
C1503	NCB21HK-103X	C CAP.	0.01μF 50V K
C1505	QETN1HM-106Z	E CAP.	10μF 50V M
C1506	NCF21CZ-105X	C CAP.	1μF 16V Z
C1511	QETN1CM-476Z	E CAP.	47μF 16V M
C1521	QFLC1HJ-332Z	M CAP.	3300pF 50V J
C1522	QFLC1HJ-822Z	M CAP.	8200pF 50V J
C1523	QEHQ1CM-228	E CAP.	2200μF 16V M
C1525	QEZ0203-107	E CAP.	100μF 160V M
Δ C1526	QFZ0197-334	MPP CAP.	0.33μF 250V J
Δ C1528	QFZ0196-802	MPP CAP.	8000pF 1.5kV ±3%
C1543	QEHRIVM-108Z	E CAP.	1000μF 35V M
C1545	QETN1EM-227Z	E CAP.	220μF 25V M
C1546	QETN1EM-477Z	E CAP.	470μF 25V M
C1548	QEHRI1CM-227Z	E CAP.	220μF 16V M

Symbol No.	Part No.	Part Name	Description	Local
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**CAPACITOR**

C1562	QETN1HM-475Z	E CAP.	4.7μF 50V	M
C1561	QETN1HM-106Z	E CAP.	10μF 50V	M
C1563	NCB21HK-103X	C CAP.	0.01μF 50V	K
C1581	QETN2EM-106Z	E CAP.	10μF 250V	M
C1582	QFV71HJ-474Z	MF CAP.	0.47μF 50V	J
C1584	QFLC2AJ-823Z	M CAP.	0.082μF 100V	J
C1702	NCS21HJ-102X	C CAP.	1000pF 50V	J
C1710-11	NDC21HJ-470X	C CAP.	47pF 50V	J
C1801-03	NCB21HK-104X	CHIP CAP.	0.1μF 50V	K
Δ C1901	QFZ9067-104	MM CAP.	0.1μFAC275V	M
Δ C1902	QFZ9067-473	MM CAP.	0.047μFAC275V	M
Δ C1910	QCZ9054-102	C CAP.	1000pFAC250V	Z
Δ C1911	QCZ9054-102	C CAP.	1000pFAC250V	Z
Δ C1912	QCZ9054-102	C CAP.	1000pFAC250V	Z
Δ C1913	QCZ9054-102	C CAP.	1000pFAC250V	Z
Δ C1914	QEZ0169-337	E CAP.	330pF 200V	M
C1921	QEH2CM-335Z	E CAP.	3.3μF 160V	M
C1951	QETN1EM-227Z	E CAP.	220μF 25V	M
Δ C1982	QCZ9078-222	C CAP.	2200pFAC250V	M
Δ C1984	QCZ9078-222	C CAP.	2200pFAC250V	M

**TRANSFORMER**

Δ T1521	CE41106-00CJ1	DRIVE TRANSF.		
Δ T1522	QQH0047-001	F B T		

**COIL**

L1308	NQL024J-220X	COIL	22μH	
L1521	CE41267-00B	LINEARITY COIL		
L1571	QQLZ018-360	HEATER CHOKE		

**DIODE**

D1201-03	MA111-X	SI DIODE		
D1301	MA111-X	SI DIODE		
D1421	1N4003-T2	SI DIODE		
D1422	MTZ175-T2	ZENER DIODE		
D1423	MA111-X	SI DIODE		
D1501	MA3091/M/-X	ZENER DIODE		
D1502	1SR35-400A-T2	SI DIODE		
D1511	MA3033-X	ZENER DIODE		
D1521-22	1SR35-400A-T2	SI DIODE		
D1541	RGP10J-5025-T3	SI DIODE		
D1543-44	RGP10J-5025-T3	SI DIODE		
D1545	1SR35-400A-T2	SI DIODE		
D1561	1S581-T2	SI DIODE		
Δ D1562	MA4068N/Z1/-T2	ZENER DIODE		
D1567	MA111-X	SI DIODE		
D1581	RH15-T3	SI DIODE		
D1582	RGP10J-5025-T3	SI DIODE		
D1583	MA3091/M/-X	ZENER DIODE		
D1702	MA3039/H/-X	ZENER DIODE		
D1703	MA111-X	SI DIODE		
D1715-16	MA3056-X	ZENER DIODE		
D1801-03	MA3051/M/-X	ZENER DIODE		
D1804	MA3120-X	ZENER DIODE		
Δ D1911	D35860	BRIDGE DIODE		
D1951	MA111-X	SI DIODE		
D1958	MA111-X	SI DIODE		

**TRANSISTOR**

Q1201	2SA1037AK/QR/-X	SI TRANSISTOR		
Q1203	2SC2412K/QR/-X	SI TRANSISTOR		
Q1205	2SC2412K/QR/-X	SI TRANSISTOR		
Q1303	2SA1037AK/QR/-X	SI TRANSISTOR		
Q1511	2SA966/OY/-T	SI TRANSISTOR		
Q1512	DTC144GA-X	DIGI. TRANSISTOR		
Q1521	2SC2655/Y/-T	SI TRANSISTOR		
Δ Q1522	2SD2499-LB	SI TRANSISTOR		H. OUT
Q1561	2SC2785/JH/-T	SI TRANSISTOR		
Q1562	2SA933AS/QR/-T	SI TRANSISTOR		
Q1711	DTC124EKA-X	DIGI. TRANSISTOR		
Q1951	2SC2412K/QR/-X	SI TRANSISTOR		

Symbol No.	Part No.	Part Name	Description	Local
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**IC**

Δ IC1201	TA1242N	I.C. (MONO-ANA)		
Δ IC1421	LA7830	I.C. (MONO-ANA)		
IC1541	AN7809F	I.C. (MONO-ANA)		
Δ IC1921	STR30134	I.C. (H)		

**OTHERS**

	CEMG002-001Z	FUSE CLIP		
	CEMG002-001Z	FUSE CLIP		
	CSB503F30-T2	CER. RESONATOR		
Δ CF1501	QMF0007-6R3J1	FUSE	6.3A	
Δ F1901	QMF0007-1R25J1	FUSE	1.25 A	
Δ F1561	QRZ9009-4R7	FUSI. RESISTOR	4.7 Ω 1/2W	J
Δ F1562	QRZ9021-1R0	FUSI. RESISTOR	1.0 Ω 1W	J
Δ F1563	QRZ9021-1R0	FUSI. RESISTOR	1 Ω 1W	J
Δ F1572	QRZ9009-2R2	FUSI. RESISTOR	2.2 Ω 1/2W	J
Δ F1581	QRZ9009-2R2	FUSI. RESISTOR	2.2 Ω 1/2W	J
Δ LF1901	QQR0969-001	LINE FILTER		
Δ RY1901	QSK0092-001	RELAY		
Δ TH1901	CEKP001-001J1	P. THERMISTOR		
Δ VA1901	ERZV10V621CS	VARIATOR		
	W1004-05	MG R	0.0Ω 1/10W	J
	W1024-25	MG R	0.0Ω 1/10W	J
	W1033	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1042	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1050	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1072	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1082	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1105	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1107-09	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1111	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1113-14	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1116	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1118-19	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1122	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	W1125-26	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	X1301	CE41651-001Z	CRYSTAL	
	Y1261-62	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	Y1301	NRSA02J-OROX	MG R	0.0Ω 1/10W J
	Y1503	NRSA02J-OROX	MG R	0.0Ω 1/10W J

**CRT SOCKET P.W. BOARD ASS'Y (SFC-3001A-H2)**

Symbol No.	Part No.	Part Name	Description	Local
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**RESISTOR**

R3351-56	NRSA02J-331X	MG R	330Ω 1/10W	J
R3357-59	NRSA02J-101X	MG R	100Ω 1/10W	J
R3360-62	QRZ0107-152Z	C R	1.5kΩ 1/2W	K
R3363-65	QRL029J-153	OM R	15kΩ 2W	J
R3366-68	NRSA02J-222X	MG R	2.2kΩ 1/10W	J
R3381	QRE121J-394Y	C R	390kΩ 1/2W	J

**CAPACITOR**

C3354-56	NDC21HJ-221X	C CAP.	220pF 50V	J
C3357	QETN1CM-107Z	E CAP.	100μF 16V	M
C3361-63	NCS21HJ-271X	C CAP.	270pF 50V	J
Δ C3382	QCZ0121-102	C CAP.	1000pF 3000V	Z

**COIL**

L3354-56	QQL038J-4R7Z	COIL	4.7μH	J
L3381	QQL038J-101Z	COIL	100μH	J

**TRANSISTOR**

Q3351-53	2SC4544-LB	SI TRANSISTOR		
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**OTHERS**

Δ SK3351	CE42446-001	C.R.T. SOCKET		
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# PARTS LIST(VCR)

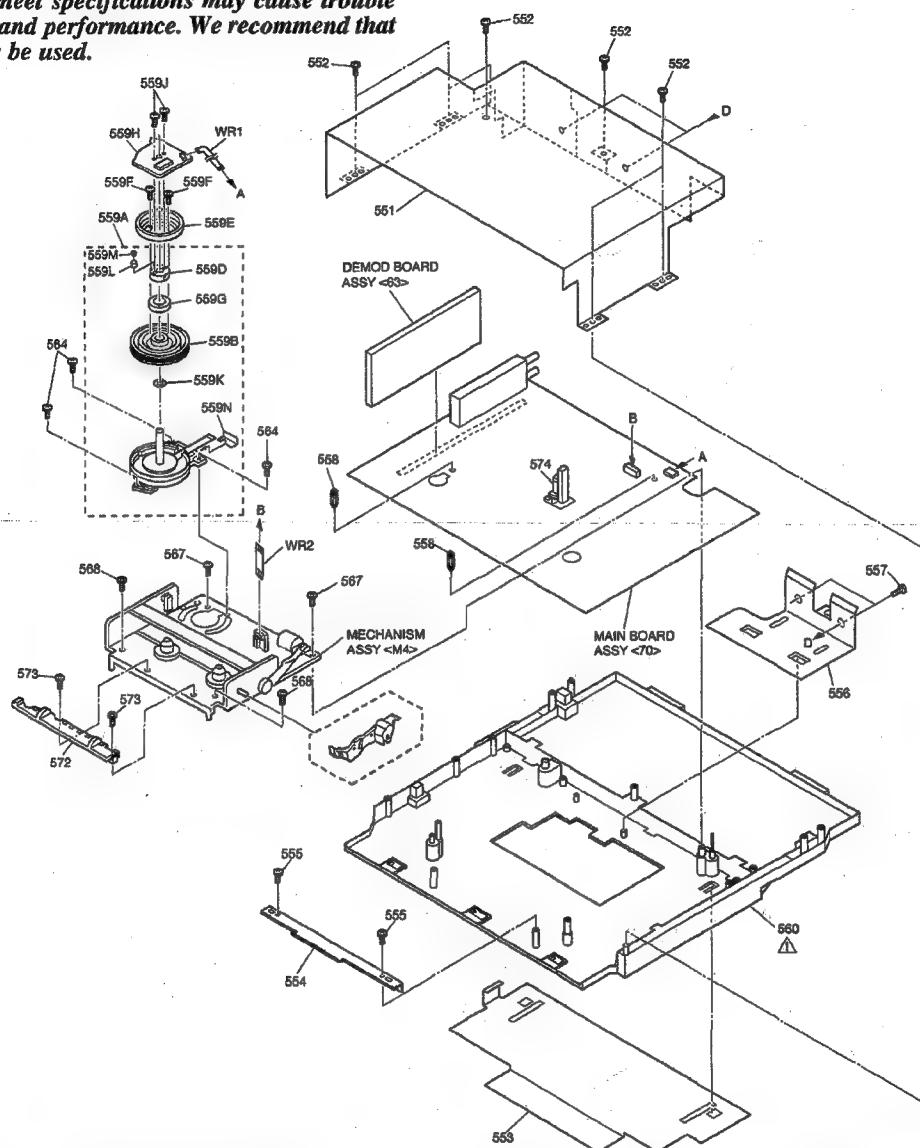
## SAFETY PRECAUTION

Parts identified by the  $\Delta$  symbol are critical for safety. Replace only with specified part numbers.

### 5.1 CABINET AND CHASSIS ASSEMBLY <M2>

#### BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



#  $\Delta$  REF No. PART No. PART NAME, DESCRIPTION

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#### CABINET AND CHASSIS ASSEMBLY <M2>

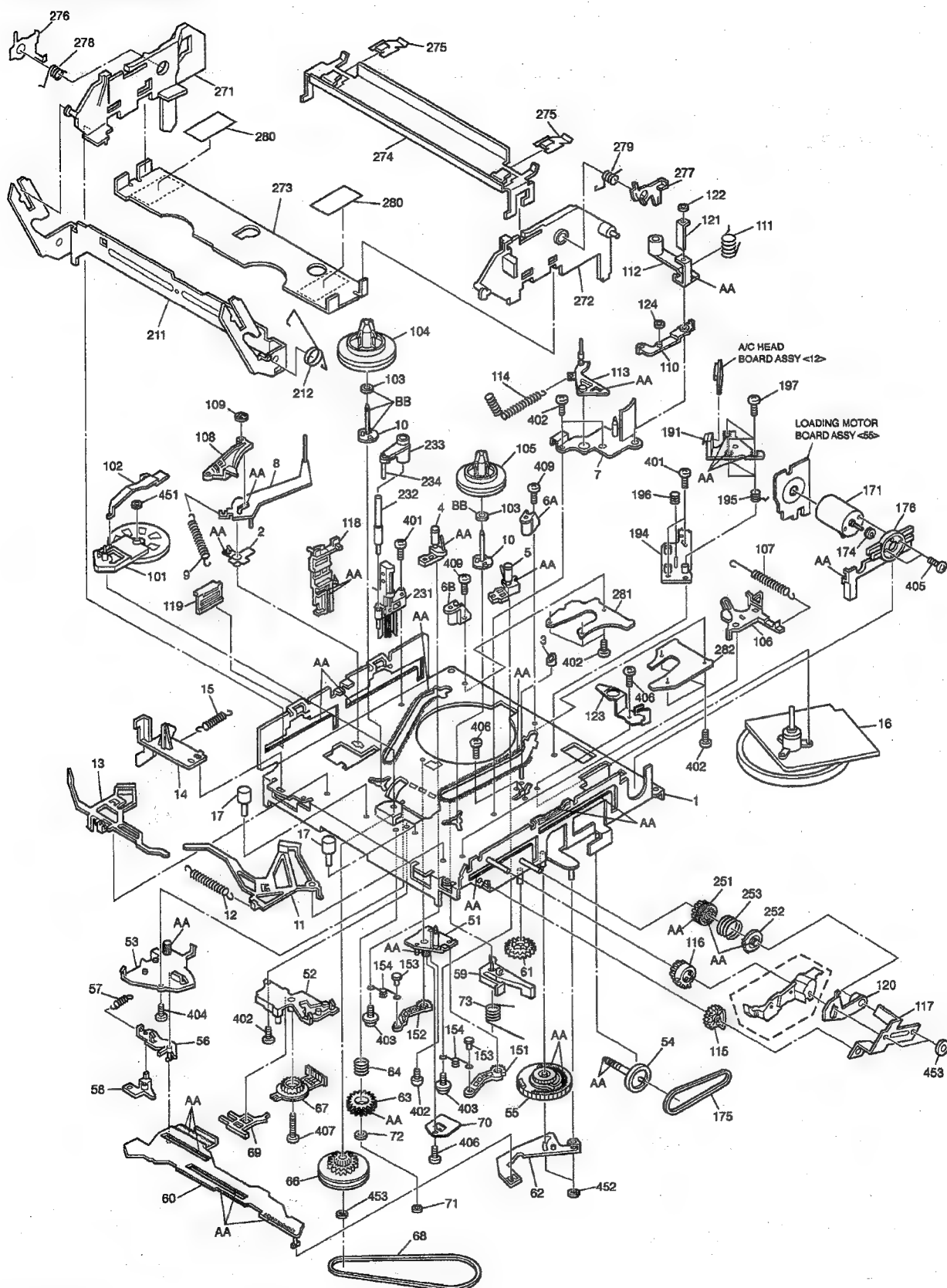
551	LC10258-001B-H	TOP COVER
552	QYTDSF3010Z	SCREW,X6 TOP COVER
553	LC20264-001A-H	BOTTOM SHIELD
554	LC30576-001A-H	VTR BRACKET
555	QYTDSF3010Z	SCREW,X2
556	LC30493-001A-H	SHIELD COVER
557	QYSDST3006Z	SCREW,X2
558	LP40226-001A	PC SUPPORT,X2
559A	LP20371-002A	DRUM SUB ASSY
559B	LP20084-002A	UPPER DRUM ASSY
559D	LP40028-002A	COLLAR ASSY
559E	QAR0020-003	ROTOR ASSY
559F	QYSPSP3006Z	SCREW

#  $\Delta$  REF No. PART No. PART NAME, DESCRIPTION

559G	PDM4439	CAP
559H	QAR0021-002	STATOR ASSY
559J	QYSPSPL2607Z	SCREW,X2
559K	PDM4444-19-2	WASHER
559L	LP40323-001A	CONTACT
559M	LP30004-005A	COMPRESS.SPRING
559N	LP40174-001B	FPC PLATE
$\Delta$ 560	LC10257-001D-H	CHASSIS BASE
564	QYTDSF2610Z	SCREW,X3 DRUM
567	QYTDSF4012Z	SCREW,X2 MECHA
568	QYTDSF3010Z	SCREW,X2 MECHA
572	LP30247-001B	FRONT BRACKET
573	QYTDSF2606Z	SCREW,X2 FRONT BRACKET
574	LP40253-001B	STOPPER
WR1	QUQ212-0520CG	FFC WIRE,DRUM CN3002
WR2	WJT0005-001A	E-CARD WIRE,A/C HEAD CN2001



## 5.2 MECHANISM ASSEMBLY &lt;M4&gt;



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

**NOTE:** The section marked in AA and BB indicate lubrication and greasing areas.

# Δ REF No. PART No. PART NAME, DESCRIPTION  
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### MECHANISM ASSEMBLY <M4>

1	LP20228-003F	MAIN DECK ASSY
2	LP30232-002A	T.ARM BEARING
3	LP40097-001B	G.POLE CAP
4	LP40101-002C	P.BASE ASSY(S)
5	LP40104-002C	P.BASE ASSY(T)
6A	LP40096-001B	UV CATCHER
6B	LP30409-002C	UV CATCHER 2
7	LP20234-001E	LID GUIDE
8	LP40108-001A	TENSION ARM ASSY
9	LP30003-010A	TENSION SPRING
10	LP40123-001A	REEL SHAFT,X2
11	LP40111-002C	MAIN BRAKE AY (TAKE-UP)
12	LP30003-002A	TENSION SPRING
13	LP40110-002F	MAIN BRAKE ASSY (SUPPLY)
14	LP30245-001D	REC SAFTY LEVER
15	LP30003-004A	TENSION SPRING
16	QAR0018-006	CAPSTAN MOTOR
17	PQ46302-1-3	ADJUST PIN,X2
51	LP30223-003C	LOADING ARM GEAR SHAFT
52	LP20233-003D	R.ENCODER GUIDE
53	LP30226-003B	CTL.PLATE GUIDE
54	LP40120-001A	WORM GEAR
55	LP30229-001D	CTL.CAM
56	LP30249-003B	T.UP LEVER
57	LP30003-006A	TENSION SPRING
58	LP40119-002A	T.UP HEAD
59	LP40113-001A	C.BRAKE ASSY
60	LP10080-002G	CTL.PLATE
61	LP30237-002B	CASSETTE GEAR
62	LP40107-002A	LINK LEVER ASSY
63	LP40122-001B	DIRECT GEAR
64	LP40224-001C	COMPRESSION SPRING
66	LP40115-002C	CLUTCH UNIT
67	QSW0554-003	ROTARY ENCODER
68	LP30005-005B	BELT,CAPSTAN MOTOR
69	LP30235-002A	CHANGE LEVER
70	LP40379-001A	CTL BRACKET(1)
71	LP30016-001A	SLIT WASHER
72	LP30017-009A	SPACER,D.GEAR
73	LP40355-002A	TORSION SPRING,C.BRAKE
101	LP40114-002E	IDLER ARM ASSY
102	LP30236-002B	IDLER LEVER
103	LP30017-004A	SPACER,X2 REEL DISK
104	LP20237-001B	REEL DISK (SUPPLY)
105	LP20238-001B	REEL DISK (TAKE-UP)
106	LP40112-001E	S.BRAKE(T)ASSY
107	LP40357-001B	TENSION SPRING
108	LP40109-002D	T.BRAKE ASSY
109	PQ46302-1-3	ADJUST PIN
110	LP40149-001B	P.LEVER ASSY
111	LP40148-002A	TORSION SPRING
112	LP40105-001B	P.R.ARM ASSY
113	LP40106-002C	GUIDE ARM ASSY
114	LP40134-001C	TENSION SPRING
115	LP30243-001D	DRIVE GEAR
116	LP30242-002A	RELAY GEAR
117	LP40214-001A	C.H.BRACKET
118	LP30244-001D	GUIDE RAIL

# Δ REF No. PART No. PART NAME, DESCRIPTION	
119 LP40118-001A	RAIL CAP
120 LP30339-001C	OPENER GUIDE
121 LP40382-001A	P.R.SHEET,P.R.ARM
122 LP30016-002A	SLIT WASHER,P.R.ARM
123 LP30482-001B	P.ROLLER GUIDE
124 LP40404-001A	SPACER,P LEVER ASSY
151 LP40103-002B	LOADING ARM GEAR(T)
152 LP30224-001A	LOADING ARM GEAR(S)
153 LP40100-001A	PIN,LOADING ARM(T)
LP40100-001A	PIN,LOADING ARM(S)
154 LP40099-001A	TORSION ARM,LOADING ARM(T)
LP40099-001A	TORSION ARM,LOADING ARM(S)
171 QAR0023-001	LOADING MOTOR
174 PQ43546-1-2	MOTOR PULLEY
175 LP30005-003A	BELT
176 LP30230-001B	MOTOR GUIDE
191 QAH0010-004	AC HEAD
194 LP30228-001A	HEAD BASE
195 LP30004-013A	COMPRES. SPRING
196 LP40236-001A	COMPRESSION SPRING
197 LP40213-002B	SPECIAL SCREW,X3 AC HEAD
211 LP20240-001C	DRIVE ARM
212 LP40137-001A	TORSION SPRING
231 NAH0001-001	FULL ERASE HEAD
232 LP40098-001B	GUIDE POLE(S)
233 LP30459-001A	T.STUD BASE
234 LP40367-002A	TENSION STUD
251 LP30239-002F	LIMIT GEAR(1)
252 LP30240-002E	LIMIT GEAR(2)
253 LP40136-001D	TORSION SPRING
271 LP10081-001H	SIDE HOLDER(L)
272 LP40403-001D	S.HOLDER(R)ASSY
273 LP30257-001D	CASSETTE HOLDER
274 LP20241-001D	TOP PLATE
275 LP30258-001B	SPRING PLATE,X2
276 LP30255-001G	LOCK LEVER(L)
277 LP30256-001E	LOCK LEVER(R)
278 LP40168-001A	TOR.SPRING(L)
279 LP40218-001B	TOR.SPRING(R)
280 LP30019-006C	PAD,X2 CASSTTE HOLDER
281 LP40275-001A	PLATE(S)
282 LP40276-001A	PLATE(T)
401 QYTDST2608Z	SCREW,FULL ERASE HEAD
QYTDST2608Z	SCREW,X2 AC HEAD
402 QYTDST2606Z	SCREW,LOADING ARM GEAR SHAFT
QYTDST2606Z	SCREW,ROTARY ENCODER GUIDE
QYTDST2606Z	SCREW,X2 LID GUIDE
QYTDST2606Z	SCREW,X6 PLATE(S,T)
403 QYSPSTG2606Z	SCREW,POLE BASE(S)
QYSPSTG2606Z	SCREW,POLE BASE(T)
404 QYTPST2605Z	SCREW,CONTROL PLATE GUIDE
405 QYTPSP3003Z	SCREW,X2 LOADING MOTOR
406 QYTDSP2608M	SCREW,CTL BRACKET(1)
QYTDSP2608M	SCREW,X3 CAPSTAN MOTOR
407 QYTPST2620Z	SCREW,ROTARY ENCODER
409 QYTPST2606Z	SCREW,X2 UV CATCHER
451 LP30016-001A	SLIT WASHER,IDLER ARM
452 PQM30017-24	SLIT WASHER,CONTROL CAM
PQM30017-24	SLIT WASHER,LINK LEVER
453 PQM30017-47	SLIT WASHER,CLUTCH
PQM30017-47	SLIT WASHER,X2 CH BRACKET

## 5.3 ELECTRICAL PARTS LIST

# △ REF No. PART No. PART NAME, DESCRIPTION  
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## AUDIO CONTROL BOARD ASSEMBLY &lt;12&gt;

PW1 LPA10010-01A1 A/C HEAD BOARD ASSY  
 CN1 QGF1208F1-07 FPC CONNECTOR

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## LOADING MOTOR BOARD ASSEMBLY &lt;55&gt;

PW2 LPA10010-01A2 L.MOTOR BOARD ASSY  
 CN1 QGB2533K1-02 CONNECTOR

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## DEMOD BOARD ASSEMBLY &lt;63&gt;

PW1 LPA10050-01B DEMOD PWB ASSY  
 IC6851 UPC1851BCU IC  
 D6851 RD9.1ES/B2/-T2 ZENER DIODE  
 or UZ9.1BSB ZENER DIODE  
 or MTZJ9.1B ZENER DIODE  
 D6852 RD9.1ES/B2/-T2 ZENER DIODE  
 or MTZJ9.1B ZENER DIODE  
 or UZ9.1BSB ZENER DIODE  
 R6851 QRE141J-102Y RESISTOR 1kΩ, 1/4W  
 R6852 QRE141J-682Y RESISTOR 6.8kΩ, 1/4W  
 R6853 QRE141J-332Y RESISTOR 3.3kΩ, 1/4W  
 R6854 QRE141J-683Y RESISTOR 68kΩ, 1/4W  
 R6855 QRE141J-333Y RESISTOR 33kΩ, 1/4W  
 R6856 QRE141J-332Y RESISTOR 3.3kΩ, 1/4W  
 R6857 QRA14CF-1501Y CMF RESISTOR 1.50kΩ, 1/4W  
 R6858 QRA14CF-1502Y CMF RESISTOR 15.0kΩ, 1/4W  
 R6859 QRE141J-562Y RESISTOR 5.6kΩ, 1/4W  
 R6860 QRE141J-561Y RESISTOR 560Ω, 1/4W  
 R6861 QRE141J-561Y RESISTOR 560Ω, 1/4W  
 R6865 QRE141J-563Y RESISTOR 56kΩ, 1/4W  
 R6866 QRE141J-182Y RESISTOR 1.8kΩ, 1/4W  
 R6867 QRE141J-182Y RESISTOR 1.8kΩ, 1/4W  
 R6868 QRE141J-822Y RESISTOR 8.2kΩ, 1/4W  
 R6869 QRE141J-822Y RESISTOR 8.2kΩ, 1/4W  
 C6851 QEKJ1CM-107 E CAPACITOR 100μF, 16V  
 C6852 QFN31HJ-103 F CAPACITOR 0.01μF, 50V  
 C6853 QEKJ1CM-476 E CAPACITOR 47μF, 16V  
 C6854 QFN31HK-104 F CAPACITOR 0.1μF, 50V  
 C6855 QEQF1CM-475 NP E CAPACITOR 4.7μF, 16V  
 C6856 QEQF1HM-105 NP E CAPACITOR 1μF, 50V  
 C6857 QEKJ1HM-225 E CAPACITOR 2.2μF, 50V  
 C6858 QFN31HJ-473 F CAPACITOR 0.047μF, 50V  
 C6859 QEKJ1HM-474 E CAPACITOR 0.47μF, 50V  
 C6860 QFN31HJ-104 F CAPACITOR 0.1μF, 50V  
 C6861 QFN31HJ-104 F CAPACITOR 0.1μF, 50V  
 C6862 QBTC1CK-335Z T CAPACITOR 3.3μF, 16V  
 C6863 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 C6864 QBTC1CK-106Z T CAPACITOR 10μF, 16V  
 C6865 QEKJ1HM-105 E CAPACITOR 1μF, 50V

# △ REF No. PART No. PART NAME, DESCRIPTION  
 C6866 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 C6867 QEKJ1CM-336 E CAPACITOR 33μF, 16V  
 C6868 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 C6870 QEKJ1HM-225 E CAPACITOR 2.2μF, 50V  
 C6871 QFN31HJ-222 F CAPACITOR 0.0022μF, 50V  
 C6872 QFN31HJ-104 F CAPACITOR 0.1μF, 50V  
 C6873 QEKJ1HM-225 E CAPACITOR 2.2μF, 50V  
 C6874 QFN31HJ-222 F CAPACITOR 0.0022μF, 50V  
 C6875 QFN31HK-104 F CAPACITOR 0.1μF, 50V  
 C6878 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 C6879 QEKJ1CM-106 E CAPACITOR 10μF, 16V  
 C6880 QEKJ1CM-106 E CAPACITOR 10μF, 16V  
 C6881 QEKJ1CM-106 E CAPACITOR 10μF, 16V  
 C6882 QEKJ1CM-106 E CAPACITOR 10μF, 16V  
 C6883 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 C6884 QEKJ1HM-105 E CAPACITOR 1μF, 50V  
 BK1 LP40077-001A BRACKET(PWB), X2  
 CN6801 QGG2503K2-26 HEADER PIN, (1-26) MAIN  
 CN6802 QGG2503K2-26 HEADER PIN, (1-26) MAIN  
 CN6851 QGA2501F1-05 W TO B CONNE, (1-5)  
 CN6852 QGA2501F1-03 W TO B CONNE, (1-3)

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## MAIN BOARD ASSEMBLY &lt;70&gt;

PW1 LPA10040-03B MAIN BOARD ASSY  
 IC1 HA118211NF IC  
 or HA118211BNF IC  
 IC3001 M37777M7A2B8GP IC  
 IC3002 TA7291S IC  
 IC3003 S-80740AN-Z IC  
 IC3004 X24C01AP IC  
 or XL24C01AP IC  
 or 24LC01B/P IC  
 or AT24C01A-10PC IC  
 IC5301 LA5613 IC  
 IC7201 GP1U281Q IR DETECT UNIT  
 IC9001 MN18P76476BP-05 IC  
 or MN1874876JM IC  
 IC9002 AT24C04TV20240 IC  
 IC9003 MN1382/Q/-X IC  
 IC9601 M51321P IC  
 IC9621 LA4261 IC  
 Q9 2SA1037AK/QR/-X TRANSISTOR  
 Q31 DTC144WK TRANSISTOR  
 Q40 DTC144WK TRANSISTOR  
 Q41 DTC144WK TRANSISTOR  
 Q2001 2SC2412K/QR/-X TRANSISTOR  
 Q2002 2SC2412K/QR/-X TRANSISTOR  
 Q2003 DTA144WK TRANSISTOR  
 Q2051 2SC2412K/QR/-X TRANSISTOR  
 Q2052 2SA1037AK/QR/-X TRANSISTOR  
 Q2053 DTC144WK TRANSISTOR  
 Q2054 2SA1037AK/QR/-X TRANSISTOR  
 Q2055 DTC144WK TRANSISTOR  
 Q3001 PTZ-NV16 PHOTO TRANSISTOR  
 Q3002 PTZ-NV16 PHOTO TRANSISTOR  
 Q3003 2SC2412K/QR/-X TRANSISTOR

# ▲ REF No. PART No. PART NAME, DESCRIPTION

Q3801	2SB927/ST-T	TRANSISTOR
Q3802	DTC114EK	TRANSISTOR
Q4001	DTC114EK	TRANSISTOR
Q4002	2SC2412K/QR/-X	TRANSISTOR
Q5101	2SK2043-CB14	FE TRANSISTOR
	or 2SK2324-LT	POWER MOS FET
	or 2SK1953-LF	FE TRANSISTOR
Q5102	2SD2144S/UV-T	TRANSISTOR
Q6001	2SC3243/DE-T	TRANSISTOR
Q6030	2SA1037AK/QR/-X	TRANSISTOR
Q6031	DTC143TK	TRANSISTOR
Q6040	2SC2412K/QR/-X	TRANSISTOR
Q6041	2SA1037AK/QR/-X	TRANSISTOR
Q6042	DTC124EK	TRANSISTOR
Q6701	2SD2061/EF/	TRANSISTOR
Q6702	DTA114EK	TRANSISTOR
Q6703	2SC1740S/QRS/-T	TRANSISTOR
Q6706	DTC144WK	TRANSISTOR
Q7201	2SC2412K/QR/-X	TRANSISTOR
Q7202	2SC2412K/QR/-X	TRANSISTOR
Q7203	2SC2412K/QR/-X	TRANSISTOR
Q7251	2SC2412K/QR/-X	TRANSISTOR
Q7252	2SC2412K/QR/-X	TRANSISTOR
Q9001	2SC2412K/QR/-X	TRANSISTOR
Q9003	DTA114EK	TRANSISTOR
Q9004	DTC144WK	TRANSISTOR
Q9005	DTA144WK	TRANSISTOR
Q9006	DTC144WK	TRANSISTOR
Q9007	2SC2412K/QR/-X	TRANSISTOR
Q9601	DTC144WK	TRANSISTOR
Q9602	DTC144WK	TRANSISTOR
Q9603	2SA1037AK/QR/-X	TRANSISTOR
Q9621	2SA1037AK/QR/-X	TRANSISTOR
Q9622	2SC2412K/QR/-X	TRANSISTOR
Q9623	2SC2412K/QR/-X	TRANSISTOR
Q9624	2SC2412K/QR/-X	TRANSISTOR
Q9625	2SA1037AK/QR/-X	TRANSISTOR
Q9626	2SC2412K/QR/-X	TRANSISTOR
D16	1N4148M	DIODE
	or 1SS133	DIODE
D17	1N4148M	DIODE
	or 1SS133	DIODE
D2001	1N4148M	DIODE
	or 1SS133	DIODE
D3001	LNB2301L01VI	LE DIODE
D3002	1N4148M	DIODE
	or 1SS133	DIODE
D3005	11ES2	DIODE
D3801	11ES2	DIODE
D3802	11ES2	DIODE
D3803	11ES2	DIODE
D3804	11ES2	DIODE
D4003	1N4148M	DIODE
	or 1SS133	DIODE
D4004	1N4148M	DIODE
	or 1SS133	DIODE
D5001	S1WB(A)60F4102	BRIDGE DIODE
	or S1WB(A)60F4062X	BRIDGE DIODE
	or S1WB(A)60F4072X	BRIDGE DIODE
D5101	AU01	FR DIODE
	or ERA18-04-T2	FR DIODE

# ▲ REF No. PART No. PART NAME, DESCRIPTION

	or PG104RS	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS4	FR DIODE
D5102	AU01	FR DIODE
	or ERA18-04-T2	FR DIODE
	or PG104RS	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS4	FR DIODE
D5103	1SS133	DIODE
D5104	MTZJ15C	ZENER DIODE
	or RD15ES/B3/-T2	ZENER DIODE
D5105	MTZJ15C	ZENER DIODE
	or RD15ES/B3/-T2	ZENER DIODE
D5201	ERA18-02-T2	FR DIODE
	or AU01Z	FR DIODE
	or PG104RS	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS2	FR DIODE
D5202	FML-12S	FR DIODE
	or MA644	FR DIODE
	or FCF06A20	FR DIODE
	or YG901C2	FR DIODE
D5207	AK04	DIODE
	or 11EQS04	SB DIODE
D5210	AU01Z	FR DIODE
	or ERA18-02-T2	FR DIODE
	or PG104RS	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS2	FR DIODE
D5301	MTZJ15A	ZENER DIODE
	or RD15ES/B1/-T2	ZENER DIODE
D5306	MTZJ6.8A	ZENER DIODE
	or RD6.8ES/B1/-T2	ZENER DIODE
D6001	MTZJ10B	ZENER DIODE
D6002	HZ30-2L-T2	ZENER DIODE
	or HZ30-2LTD	Z DIODE (M)
D6040	1SS133	DIODE
D6041	1SS133	DIODE
D6701	RD7.5ES/B1/-T2	ZENER DIODE
	or MTZJ7.5A	ZENER DIODE
D6702	1N4148M	DIODE
	or 1SS133	DIODE
D6703	11ES2	DIODE
D6704	11ES2	DIODE
D7201	GL3ED8	LE DIODE
D7202	GL3ED8	LE DIODE
D7203	SLR-342MG-T16	LE DIODE
D7205	RD5.1JS/B2/-T2	ZENER DIODE
D7206	RD5.1JS/B2/-T2	ZENER DIODE
D7251	RD9.1ES/B2/-T2	ZENER DIODE
	or UZ9.1BSB	ZENER DIODE
	or MTZJ9.1B	ZENER DIODE
D7253	RD9.1ES/B2/-T2	ZENER DIODE
	or MTZJ9.1B	ZENER DIODE
	or UZ9.1BSB	ZENER DIODE
D7256	1N4148M	DIODE
	or 1SS133	DIODE
D7257	1N4148M	DIODE
	or 1SS133	DIODE
D9001	11ES2	DIODE
D9002	11ES2	DIODE

#	△ REF No.	PART No.	PART NAME, DESCRIPTION		#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
D9007		1N4148M	DIODE		R3013		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
		or 1SS133	DIODE		R3014		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
D9008		1N4148M	DIODE		R3015		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
		or 1SS133	DIODE		R3021		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
D9623		1N4148M	DIODE		R3022		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
		or 1SS133	DIODE		R3023		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R1		NRSA02J-471X	MG RESISTOR	470Ω, 1/10W	R3024		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R2		NRSA02J-561X	MG RESISTOR	560Ω, 1/10W	R3025		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R3		NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W	R3026		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R11		NRSA02J-561X	MG RESISTOR	560Ω, 1/10W	R3027		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R14		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3029		QRE141J-102Y	RESISTOR	1kΩ, 1/4W
R15		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3030		QRE141J-102Y	RESISTOR	1kΩ, 1/4W
R16		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3031		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R17		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3032		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R18		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3033		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R19		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3044		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R23		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3046		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R24		NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3047		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R25		NRSA02J-152X	MG RESISTOR	1.5kΩ, 1/10W	R3048		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R29		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3049		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R31		NRSA02J-750X	MG RESISTOR	75Ω, 1/10W	R3057		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R44		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3058		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R45		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3059		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R51		NRSA02J-125X	MG RESISTOR	1.2MΩ, 1/10W	R3060		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R110		NRSA02J-562X	MG RESISTOR	5.6kΩ, 1/10W	R3061		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R122		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3062		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R125		QRE141J-472Y	RESISTOR	4.7kΩ, 1/4W	R3063		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R131		QRE141J-0R0Y	RESISTOR	0Ω, 1/4W	R3065		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2001		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3066		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2002		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3067		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2003		NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3070		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R2004		NRSA02J-224X	MG RESISTOR	220kΩ, 1/10W	R3071		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2005		NRSA02J-181X	MG RESISTOR	180Ω, 1/10W	R3072		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2006		NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W	R3073		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R2007		NRSA02J-153X	MG RESISTOR	15kΩ, 1/10W	R3074		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R2009		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3075		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2013		NRSA02J-333X	MG RESISTOR	33kΩ, 1/10W	R3076		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2014		NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	R3079		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2016		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3080		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2018		NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3082		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2019		NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3100		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2053		NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3201		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R2054		NRSA02J-123X	MG RESISTOR	12kΩ, 1/10W	R3202		QRE141J-472Y	RESISTOR	4.7kΩ, 1/4W
R2055		NRSA02J-3R3X	MG RESISTOR	3.3Ω, 1/10W	R3203		QRE141J-103Y	RESISTOR	10kΩ, 1/4W
R2056		QRE141J-820Y	RESISTOR	82Ω, 1/4W	R3204		NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
R2057		NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3205		NRSA02J-332X	MG RESISTOR	3.3kΩ, 1/10W
R2058		NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	R3206		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R2059		NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3207		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R2060		NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	R3208		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R2601		NRSA02J-332X	MG RESISTOR	3.3kΩ, 1/10W	R3209		QRE141J-181Y	RESISTOR	180Ω, 1/4W
R2602		NRSA02J-182X	MG RESISTOR	1.8kΩ, 1/10W	R3210		NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W
R2609		NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	R3211		NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W
R2611		NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3212		NRSA02J-181X	MG RESISTOR	180Ω, 1/10W
R3001		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W	R3213		NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R3002		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3214		NRSA02J-181X	MG RESISTOR	180Ω, 1/10W
R3004		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W	R3215		NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R3005		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3216		QRE141J-474Y	RESISTOR	470kΩ, 1/4W
R3006		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W	R3217		NRSA02J-334X	MG RESISTOR	330kΩ, 1/10W
R3007		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W	R3219		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3010		NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3220		NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3011		NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W	R3222		NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W

#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION
R3223			NRSA02J-105X	MG RESISTOR 1MΩ, 1/10W	R6046			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R3224			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W	R6068			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R3226			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R6069			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R3227			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R6701			NRSA02J-221X	MG RESISTOR 220Ω, 1/10W
R3229			NRSA02J-104X	MG RESISTOR 100kΩ, 1/10W	R6702			NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
R3230			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R6703			NRSA02J-682X	MG RESISTOR 6.8kΩ, 1/10W
R3802			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R6704			NRSA02J-471X	MG RESISTOR 470Ω, 1/10W
R3803			QRE121J-331Y	RESISTOR 330Ω, 1/2W	R7201			NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
R3804			QRE141J-103Y	RESISTOR 10kΩ, 1/4W	R7202			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R4001			NRSA02J-222X	MG RESISTOR 2.2kΩ, 1/10W	R7203			NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
R4002			NRSA02J-223X	MG RESISTOR 22kΩ, 1/10W	R7204			NRSA02J-223X	MG RESISTOR 22kΩ, 1/10W
R4004			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R7205			NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
R4006			NRSA02J-392X	MG RESISTOR 3.9kΩ, 1/10W	R7206			QRE141J-561Y	RESISTOR 560Ω, 1/4W
R4007			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R7208			NRSA02J-223X	MG RESISTOR 22kΩ, 1/10W
R4009			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R7214			QRE141J-102Y	RESISTOR 1kΩ, 1/4W
R4010			NRSA02J-471X	MG RESISTOR 470Ω, 1/10W	R7215			NRSA02J-0R0X	MG RESISTOR 0Ω, 1/10W
R4011			NRSA02J-471X	MG RESISTOR 470Ω, 1/10W	R7216			NRSA02J-123X	MG RESISTOR 12kΩ, 1/10W
R4012			NRSA02J-153X	MG RESISTOR 15kΩ, 1/10W	R7217			NRSA02J-562X	MG RESISTOR 5.6kΩ, 1/10W
R4013			NRSA02J-0R0X	MG RESISTOR 0Ω, 1/10W	R7218			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W
R4018			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R7219			NRSA02J-123X	MG RESISTOR 12kΩ, 1/10W
R4019			QRE141J-102Y	RESISTOR 1kΩ, 1/4W	R7220			NRSA02J-562X	MG RESISTOR 5.6kΩ, 1/10W
R4020			QRE141J-102Y	RESISTOR 1kΩ, 1/4W	R7221			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W
R4021			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R7222			NRSA02J-123X	MG RESISTOR 12kΩ, 1/10W
R4022			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W	R7223			NRSA02J-562X	MG RESISTOR 5.6kΩ, 1/10W
R4025			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W	R7224			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W
R4026			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R7225			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R4027			QRE141J-222Y	RESISTOR 2.2kΩ, 1/4W	R7226			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R4028			NRSA02J-104X	MG RESISTOR 100kΩ, 1/10W	R7227			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R5101			QRE141J-224Y	RESISTOR 220kΩ, 1/4W	R7228			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R5102			QRE141J-224Y	RESISTOR 220kΩ, 1/4W	R7251			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W
R5103			QRE141J-683Y	RESISTOR 68kΩ, 1/4W	R7252			NRSA02J-183X	MG RESISTOR 18kΩ, 1/10W
R5104			QRG02GJ-683	OMF RESISTOR 68kΩ, 2W	R7253			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R5106			QRT01DJ-R39X	MF RESISTOR 0.39Ω, 1W	R7255			NRSA02J-473X	MG RESISTOR 47kΩ, 1/10W
R5107			QRE121J-331Y	RESISTOR 330Ω, 1/2W	R7256			NRSA02J-104X	MG RESISTOR 100kΩ, 1/10W
R5108			NRSA02J-152X	MG RESISTOR 1.5kΩ, 1/10W	R7257			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R5109			NRSA02J-681X	MG RESISTOR 680Ω, 1/10W	R7258			NRSA02J-223X	MG RESISTOR 22kΩ, 1/10W
R5110			NRSA02J-224X	MG RESISTOR 220kΩ, 1/10W	R7262			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R5111			NRSA02J-821X	MG RESISTOR 820Ω, 1/10W	R7263			QRE141J-123Y	RESISTOR 12kΩ, 1/4W
R5114			QRE141J-823Y	RESISTOR 82kΩ, 1/4W	R9001			NRSA02J-104X	MG RESISTOR 100kΩ, 1/10W
R5115			QRE141J-563Y	RESISTOR 56kΩ, 1/4W	R9004			QRE141J-102Y	RESISTOR 1kΩ, 1/4W
R5305			QRE141J-102Y	RESISTOR 1kΩ, 1/4W	R9013			NRSA02J-332X	MG RESISTOR 3.3kΩ, 1/10W
R5306			NRSA02J-333X	MG RESISTOR 33kΩ, 1/10W	R9014			NRSA02J-332X	MG RESISTOR 3.3kΩ, 1/10W
R5307			QRE141J-471Y	RESISTOR 470Ω, 1/4W	R9015			NRSA02J-332X	MG RESISTOR 3.3kΩ, 1/10W
R5312			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R9017			NRSA02J-472X	MG RESISTOR 4.7kΩ, 1/10W
R5313			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R9021			NRSA02J-0R0X	MG RESISTOR 0Ω, 1/10W
R6001			NRSA02J-271X	MG RESISTOR 270Ω, 1/10W	R9022			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
R6002			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W	R9024			QRE141J-102Y	RESISTOR 1kΩ, 1/4W
R6020			QRE141J-0R0Y	RESISTOR 0Ω, 1/4W	R9025			QRE141J-102Y	RESISTOR 1kΩ, 1/4W
R6021			QRE141J-0R0Y	RESISTOR 0Ω, 1/4W	R9026			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6022			NRSA02J-0R0X	MG RESISTOR 0Ω, 1/10W	R9027			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6030			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W	R9028			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6032			NRSA02J-822X	MG RESISTOR 8.2kΩ, 1/10W	R9029			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6033			NRSA02J-182X	MG RESISTOR 1.8kΩ, 1/10W	R9036			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6034			NRSA02J-105X	MG RESISTOR 1MΩ, 1/10W	R9038			NRSA02J-102X	MG RESISTOR 1kΩ, 1/10W
R6039			QRE141J-0R0Y	RESISTOR 0Ω, 1/4W	R9040			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
R6040			QRE141J-471Y	RESISTOR 470Ω, 1/4W	R9041			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
R6041			NRSA02J-184X	MG RESISTOR 180kΩ, 1/10W	R9042			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
R6042			NRSA02J-103X	MG RESISTOR 10kΩ, 1/10W	R9043			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
R6043			NRSA02J-223X	MG RESISTOR 22kΩ, 1/10W	R9046			NRSA02J-473X	MG RESISTOR 47kΩ, 1/10W
R6044			NRSA02J-822X	MG RESISTOR 8.2kΩ, 1/10W	R9049			NRSA02J-0R0X	MG RESISTOR 0Ω, 1/10W
R6045			NRSA02J-391X	MG RESISTOR 390Ω, 1/10W	R9054			NRSA02J-101X	MG RESISTOR 100Ω, 1/10W

#	△ REF No.	PART No.	PART NAME, DESCRIPTION		#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
R9055		NRSA02J-101X	MG RESISTOR	100Ω,1/10W	R9644		NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
R9056		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W	R9646		QRE141J-0R0Y	RESISTOR	0Ω,1/4W
R9061		NRSA02J-101X	MG RESISTOR	100Ω,1/10W	R9649		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R9062		NRSA02J-101X	MG RESISTOR	100Ω,1/10W	R9652		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R9063		QRE141J-101Y	RESISTOR	100Ω,1/4W	R9653		QRE141J-561Y	RESISTOR	560Ω,1/4W
R9064		QRE141J-101Y	RESISTOR	100Ω,1/4W	C1		QEK1CM-106	E CAPACITOR	10μF,16V
R9200		QRE141J-0R0Y	RESISTOR	0Ω,1/4W	C2		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R9201		NRSA02J-471X	MG RESISTOR	470Ω,1/10W	C3		NCF21CZ-105X	CAPACITOR	1μF,16V
R9202		NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W	C4		NCF21CZ-105X	CAPACITOR	1μF,16V
R9203		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C5		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R9205		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C7		QETN1CM-107	E CAPACITOR	100μF,16V
R9206		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C9		NCF21CZ-105X	CAPACITOR	1μF,16V
R9207		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C10		NCF21CZ-105X	CAPACITOR	1μF,16V
R9208		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C12		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9210		NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W	C13		QEKJ1HM-335	E CAPACITOR	3.3μF,50V
R9211		NRSA02J-681X	MG RESISTOR	680Ω,1/10W	C14		NCB21HK-333X	CAPACITOR	0.033μF,50V
R9212		NRSA02J-681X	MG RESISTOR	680Ω,1/10W	C17		NCB21HK-103X	CAPACITOR	0.01μF,50V
R9213		NRSA02J-681X	MG RESISTOR	680Ω,1/10W	C20		QEKJ1HM-225	E CAPACITOR	2.2μF,50V
R9214		NRSA02J-681X	MG RESISTOR	680Ω,1/10W	C21		NCB21HK-472X	CAPACITOR	0.0047μF,50V
R9215		QRE141J-102Y	RESISTOR	1kΩ,1/4W	C23		NCB21EK-223X	CAPACITOR	0.022μF,25V
R9217		NRSA02J-273X	MG RESISTOR	27kΩ,1/10W	C24		NCF21CZ-474X	CAPACITOR	0.47μF,16V
R9218		NRSA02J-124X	MG RESISTOR	120kΩ,1/10W	C25		NCB21EK-683X	CAPACITOR	0.068μF,25V
R9221		NRSA02J-123X	MG RESISTOR	12kΩ,1/10W	C29		QEKJ1EM-475	E CAPACITOR	4.7μF,25V
R9222		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C31		NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
R9223		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C32		NCB21HK-103X	CAPACITOR	0.01μF,50V
R9224		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C34		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9225		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C37		QEKJ0JM-476	E CAPACITOR	47μF,6.3V
R9226		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C38		NDC21HJ-240X	CAPACITOR	240pF,50V
R9227		NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W	C40		NCB21HK-103X	CAPACITOR	0.01μF,50V
R9229		NRSA02J-334X	MG RESISTOR	330kΩ,1/10W	C41		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9231		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C42		NCB21HK-103X	CAPACITOR	0.01μF,50V
R9233		QRE141J-102Y	RESISTOR	1kΩ,1/4W	C43		NDC21HJ-7R0X	CAPACITOR	7pF,50V
R9601		QRE141J-271Y	RESISTOR	270Ω,1/4W	C44		QCSB1HJ-220	CAPACITOR	22pF,50V
R9602		QRE141J-271Y	RESISTOR	270Ω,1/4W	C45		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9604		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C48		QEKJ0JM-476	E CAPACITOR	47μF,6.3V
R9605		NRSA02J-103X	MG RESISTOR	10kΩ,1/10W	C49		NDC21HJ-331X	CAPACITOR	330pF,50V
R9607		NRSA02J-102X	MG RESISTOR	1kΩ,1/10W	C51		QEKJ1HM-105	E CAPACITOR	1μF,50V
R9608		QRE141J-101Y	RESISTOR	100Ω,1/4W	C52		NCB21HJ-103X	CAPACITOR	0.01μF,50V
R9609		NRSA02J-102X	MG RESISTOR	1kΩ,1/10W	C53		QEKJ1HM-105	E CAPACITOR	1μF,50V
R9621		NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W	C54		QEKJ1HM-225	E CAPACITOR	2.2μF,50V
R9622		NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W	C55		QEKJ1CM-106	E CAPACITOR	10μF,16V
R9623		NRSA02J-101X	MG RESISTOR	100Ω,1/10W	C56		QEKJ1HM-335	E CAPACITOR	3.3μF,50V
R9625		NRSA02J-101X	MG RESISTOR	100Ω,1/10W	C57		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9626		NRSA02J-471X	MG RESISTOR	470Ω,1/10W	C58		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9627		NRSA02J-331X	MG RESISTOR	330Ω,1/10W	C59		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9628		NRSA02J-331X	MG RESISTOR	330Ω,1/10W	C60		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9629		QRE123J-3R3X	RESISTOR	3.3Ω,1/2W	C61		NDC21HJ-330X	CAPACITOR	33pF,50V
R9630		QRE123J-3R3X	RESISTOR	3.3Ω,1/2W	C62		NCB21EK-104X	CAPACITOR	0.1μF,25V
R9631		QRE141J-102Y	RESISTOR	1kΩ,1/4W	C63		NDC21HJ-151X	CAPACITOR	150pF,50V
R9632		QRE141J-102Y	RESISTOR	1kΩ,1/4W	C64		QEKJ0JM-476	E CAPACITOR	47μF,6.3V
R9633		NRSA02J-821X	MG RESISTOR	820Ω,1/10W	C65		QCFB1HZ-104	CAPACITOR	0.1μF,50V
R9634		NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W	C66		NCB21HK-103X	CAPACITOR	0.01μF,50V
R9635		NRSA02J-561X	MG RESISTOR	560Ω,1/10W	C67		QEKJ1CM-476	E CAPACITOR	47μF,16V
R9636		NRSA02J-561X	MG RESISTOR	560Ω,1/10W	C68		QEK1CM-476	E CAPACITOR	47μF,16V
R9637		NRSA02J-153X	MG RESISTOR	15kΩ,1/10W	C107		NDC21HJ-4R0X	CAPACITOR	4pF,50V
R9638		NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W	C108		QCFB1HZ-104	CAPACITOR	0.1μF,50V
R9639		NRSA02J-124X	MG RESISTOR	120kΩ,1/10W	C124		NDC21HJ-151X	CAPACITOR	150pF,50V
R9640		NRSA02J-561X	MG RESISTOR	560Ω,1/10W	C125		NDC21HJ-8R0X	CAPACITOR	8pF,50V
R9641		NRSA02J-104X	MG RESISTOR	100kΩ,1/10W	C126		NDC21HJ-100X	CAPACITOR	10pF,50V
R9642		NRSA02J-102X	MG RESISTOR	1kΩ,1/10W	C132		QCFB1HZ-104	CAPACITOR	0.1μF,50V
R9643		NRSA02J-563X	MG RESISTOR	56kΩ,1/10W	C133		QCFB1HZ-104	CAPACITOR	0.1μF,50V

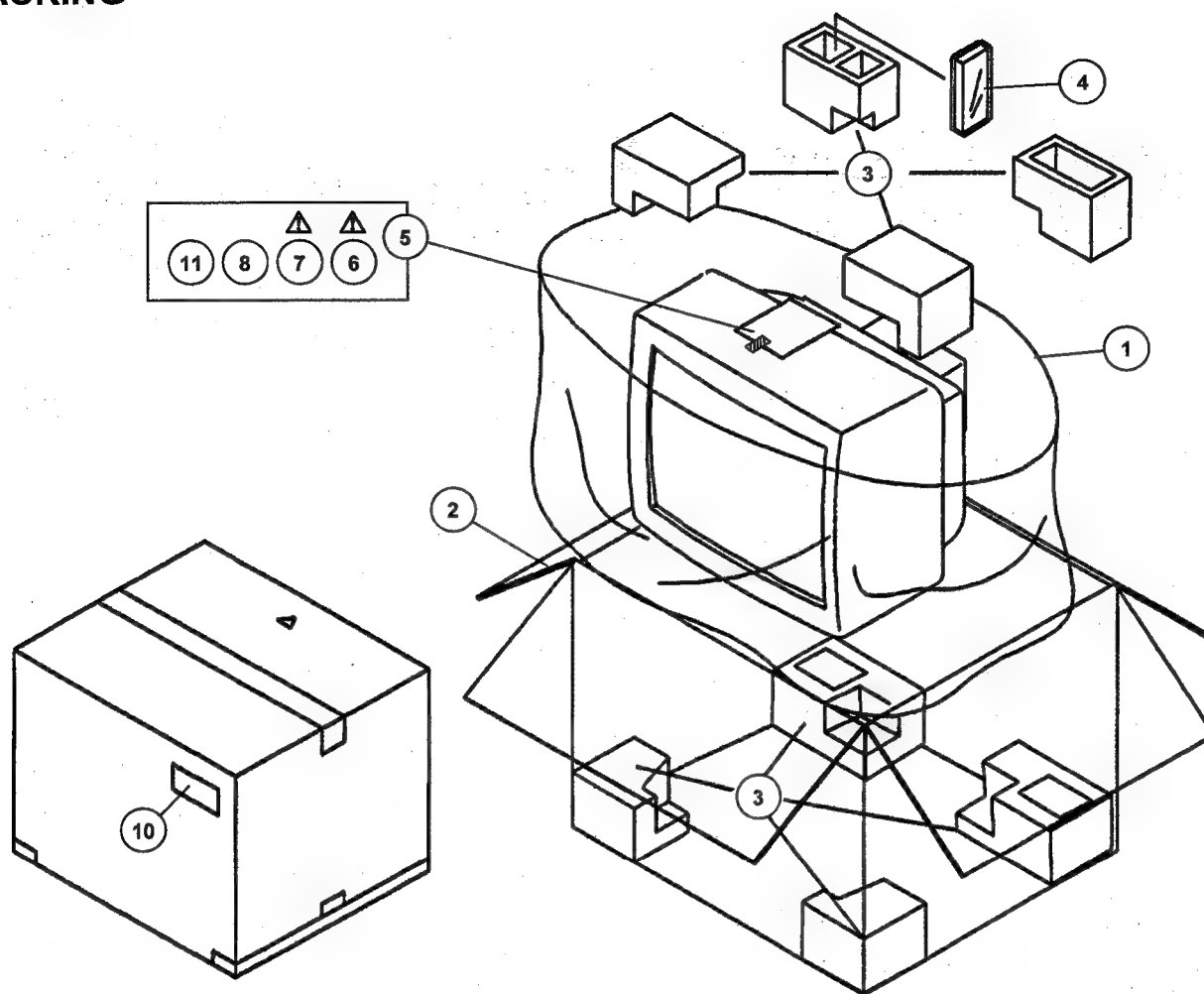


#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION
C134			NCB21EK-104X	CAPACITOR	C5105			QFLC1HJ-183Z	F CAPACITOR
C135			NCB21EK-104X	CAPACITOR	C5106			QCBB1HJ-271	CAPACITOR
C136			NCB11EK-104X	CAPACITOR	C5107			QFV11HJ-104	F CAPACITOR
C2002			QEKJ1CM-476	E CAPACITOR	C5201			QETN1AM-107	E CAPACITOR
C2003			NCB21HK-123X	CAPACITOR	C5202			QEMT1CM-827	E CAPACITOR
C2004			QEKJ1CM-226	E CAPACITOR	C5203			QETN1CM-227	E CAPACITOR
C2005			NCB21HK-102X	CAPACITOR	C5204			QEMT1AM-687	E CAPACITOR
C2007			QEKJ1CM-106	E CAPACITOR	C5205			QETC1AM-227	E CAPACITOR
C2008			NCB21HK-152X	CAPACITOR	C5207			QETC1JM-106	E CAPACITOR
C2009			QEKJ1EM-475	E CAPACITOR	C5301			QEMU0JM-227	E CAPACITOR
C2010			QEKJ1EM-475	E CAPACITOR	C5302			QTM61HM-106Z	E CAPACITOR
C2011			NCB21HK-333X	CAPACITOR	C5303			QETN1CM-107	E CAPACITOR
C2013			NCB21HK-333X	CAPACITOR	C5304			QFLC1HJ-183Z	F CAPACITOR
C2015			QEKJ1CM-226	E CAPACITOR	C6001			QETN1CM-476	E CAPACITOR
C2016			QETC1HM-475	E CAPACITOR	C6024			NCB21EK-563X	CAPACITOR
C2051			NCB21HK-331X	CAPACITOR	C6030			NCB21HK-102X	CAPACITOR
C2052			QFV61HJ-823	F CAPACITOR	C6031			QETC1HM-106	E CAPACITOR
C2053			NCB21HK-472X	CAPACITOR	C6033			NCB21HK-102X	CAPACITOR
C2054			NCB21HK-223X	CAPACITOR	C6040			QEKJ1HM-104	E CAPACITOR
C2055			QEKJ1CM-106	E CAPACITOR	C6042			NDC21HJ-471X	CAPACITOR
C3002			NCB21HK-103X	CAPACITOR	C6043			NCB21EK-223X	CAPACITOR
C3003			QETC1HM-106	E CAPACITOR	C6044			QEKJ1HM-225	E CAPACITOR
C3004			NCB21EK-104X	CAPACITOR	C6519			NCB21EK-563X	CAPACITOR
C3005			NCB21EK-104X	CAPACITOR	C6701			QEKJ1CM-107	E CAPACITOR
C3008			NCB21HK-102X	CAPACITOR	C6703			NCB21HK-102X	CAPACITOR
C3011			NRSA02J-0R0X	MG RESISTOR	C7204			NCB21EK-104X	CAPACITOR
C3013			QERF1CM-106	E CAPACITOR	C7253			QEKJ1CM-476	E CAPACITOR
C3015			NCB21HK-103X	CAPACITOR	C7254			QEKJ1HM-105	E CAPACITOR
C3016			NDC21HJ-180X	CAPACITOR	C9002			NDC21HJ-150X	CAPACITOR
C3017			NDC21HJ-100X	CAPACITOR	C9003			NDC21HJ-101X	CAPACITOR
C3021			NCB21EK-104X	CAPACITOR	C9004			NDC21HJ-101X	CAPACITOR
C3022			NCB21EK-104X	CAPACITOR	C9005			NDC21HJ-101X	CAPACITOR
C3023			NCB21EK-104X	CAPACITOR	C9006			NDC21HJ-101X	CAPACITOR
C3024			QEKJ1CM-476	E CAPACITOR	C9009			QEKJ1HM-105	E CAPACITOR
C3025			NCB21HK-103X	CAPACITOR	C9010			QEKJ1HM-105	E CAPACITOR
C3026			QERF1CM-106	E CAPACITOR	C9012			NDC21HJ-181X	CAPACITOR
C3029			NCB21HK-103X	CAPACITOR	C9013			QEKJ0JM-476	E CAPACITOR
C3030			QEKJ0JM-227	E CAPACITOR	C9014			NCB21HK-472X	CAPACITOR
C3044			QERF0JM-107	E CAPACITOR	C9017			NCB21EK-103X	CAPACITOR
C3045			NCB21EK-104X	CAPACITOR	C9018			NDC21HJ-330X	CAPACITOR
C4001			NCB21EK-104X	CAPACITOR	C9019			NDC21HJ-330X	CAPACITOR
C4002			QERF1HM-224	E CAPACITOR	C9020			NCB21EK-103X	CAPACITOR
C4004			QERF1CM-226	E CAPACITOR	C9021			QEKJ1CM-106	E CAPACITOR
C4007			NCB21HK-273X	CAPACITOR	C9022			NCB21EK-153X	CAPACITOR
C4008			QERF1CM-106	E CAPACITOR	C9023			QEKJ1CM-106	E CAPACITOR
C4009			NCB21HK-102X	CAPACITOR	C9024			NDC21HJ-390X	CAPACITOR
C4011			NCB21CK-224X	CAPACITOR	C9025			NDC21HJ-390X	CAPACITOR
C4012			NCB21EK-563X	CAPACITOR	C9026			QETN0JM-227	E CAPACITOR
C4013			NCB21HK-102X	CAPACITOR	C9027			NCB21EK-103X	CAPACITOR
C4014			NDC21HJ-101X	CAPACITOR	C9029			NDC21HJ-471X	CAPACITOR
C4015			NDC21HJ-101X	CAPACITOR	C9030			NDC21HJ-331X	CAPACITOR
C4016			QEKJ0JM-476	E CAPACITOR	C9031			QCFB1HZ-104	CAPACITOR
C4017			NCB21HJ-103X	CAPACITOR	C9602			QEKJ0JM-476	E CAPACITOR
C4019			NCB21HJ-103X	CAPACITOR	C9604			QERF1CM-106	E CAPACITOR
△ C5001			QFZ9051-683	F CAPACITOR	C9605			QERF1CM-106	E CAPACITOR
△ C5004			QCZ9101-472	CAPACITOR	C9606			QEQF1CM-106	NP E CAPACITOR
C5006			QETM2DM-826	E CAPACITOR	C9607			QERF1CM-106	E CAPACITOR
C5101			QCZ0212-472	CAPACITOR	C9608			QERF1CM-106	E CAPACITOR
C5102			QCZ0302-330Z	CAPACITOR	C9609			NCB21EK-104X	CAPACITOR
C5103			NCB21HK-331X	CAPACITOR	C9610			QERF1CM-106	E CAPACITOR
C5104			QTM61HM-105Z	E CAPACITOR	C9611			QEQF1CM-106	NP E CAPACITOR



#	△ REF No.	PART No.	PART NAME, DESCRIPTION	#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
		C9612	QERF1CM-106	E CAPACITOR	10μF,16V	HS1	PQ45788-1-2	HEAT SINK,Q5101
		C9613	QEKJ1CM-476	E CAPACITOR	47μF,16V	HS2	CEHE002-001KH	HEAT SINK
		C9614	NCB21HK-103X	CAPACITOR	0.01μF,50V	OT1	QYTDST3006Z	SCREW,Q5101
		C9615	NCB21EK-104X	CAPACITOR	0.1μF,25V	OT2	WM40503-B01	LED SPACER,X3
		C9621	QEKJ1HM-105	E CAPACITOR	1μF,50V	OT3	QYTDST3006Z	SCREW,X2 IC9621
		C9622	QEKJ1HM-105	E CAPACITOR	1μF,50V	SD1	LP30313-002A	SHIELD CASE(PRE/REC)
		C9625	NCB21EK-333X	CAPACITOR	0.033μF,25V	TU6001	QAU0092-001	TUNER
		C9627	QETN1CM-107	E CAPACITOR	100μF,16V	△ F5001	QMF51N2-1R25J1	FUSE 1.25A,AC250V
		C9628	QEKJ1CM-107	E CAPACITOR	100μF,16V	FC5001	QNG0006-001Z	FUSE CLIP,F5001
		C9629	QEKJ1CM-107	E CAPACITOR	100μF,16V	FC5002	QNG0006-001Z	FUSE CLIP,F5001
		C9630	QETN1CM-108	E CAPACITOR	1000μF,16V	J7201	CEMN072-001	PIN JACK,VIDEO IN
		C9631	QETN1CM-477	E CAPACITOR	470μF,16V	J7202	CEMN072-002	PIN JACK,AUDIO(L)IN
		C9632	QETN1CM-477	E CAPACITOR	470μF,16V	J9602	QNS0137-001	3.5 JACK,HAED PHONE
		C9633	QFV61HJ-104	F CAPACITOR	0.1μF,50V	△ LF5002	QQR0532-001	LINE FILTER
		C9634	QFV61HJ-104	F CAPACITOR	0.1μF,50V	WR9621	QUB130-08A4A4	SIN TWIST WIRE
		C9635	QEKJ1CM-106	E CAPACITOR	10μF,16V	CN1	QGF1018C2-08	FPC CONNE
		C9636	QETC1HM-107	E CAPACITOR	100μF,50V	CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HERD
		C9637	QEKJ1CM-106	E CAPACITOR	10μF,16V	CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD
		C9641	NCB21EK-333X	CAPACITOR	0.033μF,25V	CN3001	QGB2015M1-08	CONNECTOR,(1-8)CAPSTAN MOTOR
		L1	QQL29BJ-101Z	COIL	100μH	CN3002	QGF1208F1-05	FPC CONNECTOR,(1-5)DRUM MOTOR
		L2	QQL03BJ-270Z	COIL	27μH	CN3003	QGB2532J1-02	CONNECTOR,(1-2)LOADING MOTOR
		L4	QQL29BJ-101Z	COIL	100μH	CN3004	QGB2534J2-04	CONNECTOR,(1-4)ROTARY ENCODER
		L5	QQL231J-121Y	COIL	120μH	△ CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN
		L7	QQL29BJ-2R2Z	COIL	2.2μH	CN9601	QGF1201C2-25	FPC CONNECTOR,(1-25)TO TV
		L8	QQL29BJ-101Z	COIL	100μH	CN9602	QGA2501C1-03	CONNECTOR,(1-3)SPEAKER
		L9	QQL29BJ-101Z	COIL	100μH	CN9603	QGA2501C1-03	CONNECTOR,(1-3)SPEAKER
		L10	QQL29BJ-100Z	COIL	10μH	△ CP3001	ICP-N25	CIRCUIT PROTECTOR
		L17	QQLZ011-120Z	COIL	12μH	△ CP4001	ICP-N15	CIRCUIT PROTECTOR
		L20	QQL231J-680Y	COIL	68μH	△ CP6701	ICP-N25	CIRCUIT PROTECTOR
		L2001	QQL29BJ-2R2Z	COIL	2.2μH			
		L5201	PELN1184	COIL	33μH			
		L5202	PELN1184	COIL	33μH			
△	L5301	QQL01BK-101Z	COIL	100μH				
	L9001	QQL29BJ-100Z	COIL	10μH				
	L9002	QQL29BJ-100Z	COIL	10μH				
	L9003	QQL29BJ-100Z	COIL	10μH				
	L9004	QQL29BJ-100Z	COIL	10μH				
	L9005	QQL29BJ-100Z	COIL	10μH				
	X2	QAX0435-001	CRYSTAL RESONATOR					
	X3001	QAX0320-001	CRYSTAL RESONATOR					
	X9001	QAX0511-001	RESONATOR					
	S3001	QSW0602-003	PUSH SWITCH					
	S7201	QSW0797-001	TACT SWITCH,POWER					
	S7202	QSW0619-003Z	TACT SWITCH,MENU					
	S7204	QSW0797-001	TACT SWITCH,EJECT/STOP					
	S7205	QSW0619-003Z	TACT SWITCH,CH-					
	S7206	QSW0619-003Z	TACT SWITCH,VOL-					
	S7207	QSW0619-003Z	TACT SWITCH,VOL+					
	S7209	QSW0619-003Z	TACT SWITCH,CH+					
	S7210	QSW0797-001	TACT SWITCH,REC					
	S7211	QSW0797-001	TACT SWITCH,PLAY					
	S7212	QSW0797-001	TACT SWITCH,FF					
	S7213	QSW0797-001	TACT SWITCH,REW					
	K5101	QQR0678-001Z	FERRITE BEAD					
△	PC5101	PS2501-1	PH COUPLER					
△	PC5102	PS2501-1	PH COUPLER					
	PS3001	GP3S123	IC(PHOTO SENSOR)					
	PS3002	GP3S123	IC(PHOTO SENSOR)					
	T2051	PELN0832	OSC TRANSFORMER					
△	T5001	QQS0023-001	SW TRANSF					
	T6040	PELN0806	LC TRAP					

# PACKING



## PACKING PARTS LIST

### TV-20240<sub>(US)</sub>

△ Ref. No.	Part No.	Part Name	Description	Local
1	CP30967-003-H	POLY BAG		
2	CP11613-A82-H	PACKING CASE		
3	LC10262-001A-H	PACKING CUSHION		
4	RM-C139-1C	REMOCON UNIT	8pcs in set	
5	QPGA025-03505H	POLY BAG		
△ 7	LCT0316-001A-H	INST BOOK		
8	BT-51020-1H	REGISTRATION C		
10	CM47385-00B-H	POS/SERIAL LABEL		

### TV-20240<sub>(CA)</sub>

1	CP30967-003-H	POLY BAG		
2	CP11613-A82-H	PACKING CASE		
3	LC10262-001A-H	PACKING CUSHION	8pcs in 1set	
4	RM-C139-1C	REMOCON UNIT		
5	QPGA025-03505H	POLY BAG		
△ 6	LCT0317-001A-H	INST BOOK	(FRENCH)	
△ 7	LCT0316-001A-H	INST BOOK	(ENGLISH)	
8	BT-20071B-H	SVC CENTER LIST		
10	CM47385-00B-H	POS/SERIAL LABEL		
11	BT-52002-1H	WARRANTY CARD		

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<b>West Coast</b>	: 5665 Corporate Avenue, Cypress, California 90630	(714)229-8011
<b>Southeast</b>	: 1500 Lakes Parkway, Lawrenceville, Georgia 30243	(770)339-2522
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# **JVC**

# JVC

## SERVICE MANUAL

### COLOR TELEVISION

# TV-20240<sub>(US&CA)</sub>

BASIC CHASSIS

FC

Supplementary

Since some details of the TV-20240(US&CA) service manual (No.51520 Mar. 1999) were changed, we are informing you of these changes and of the new descriptions.

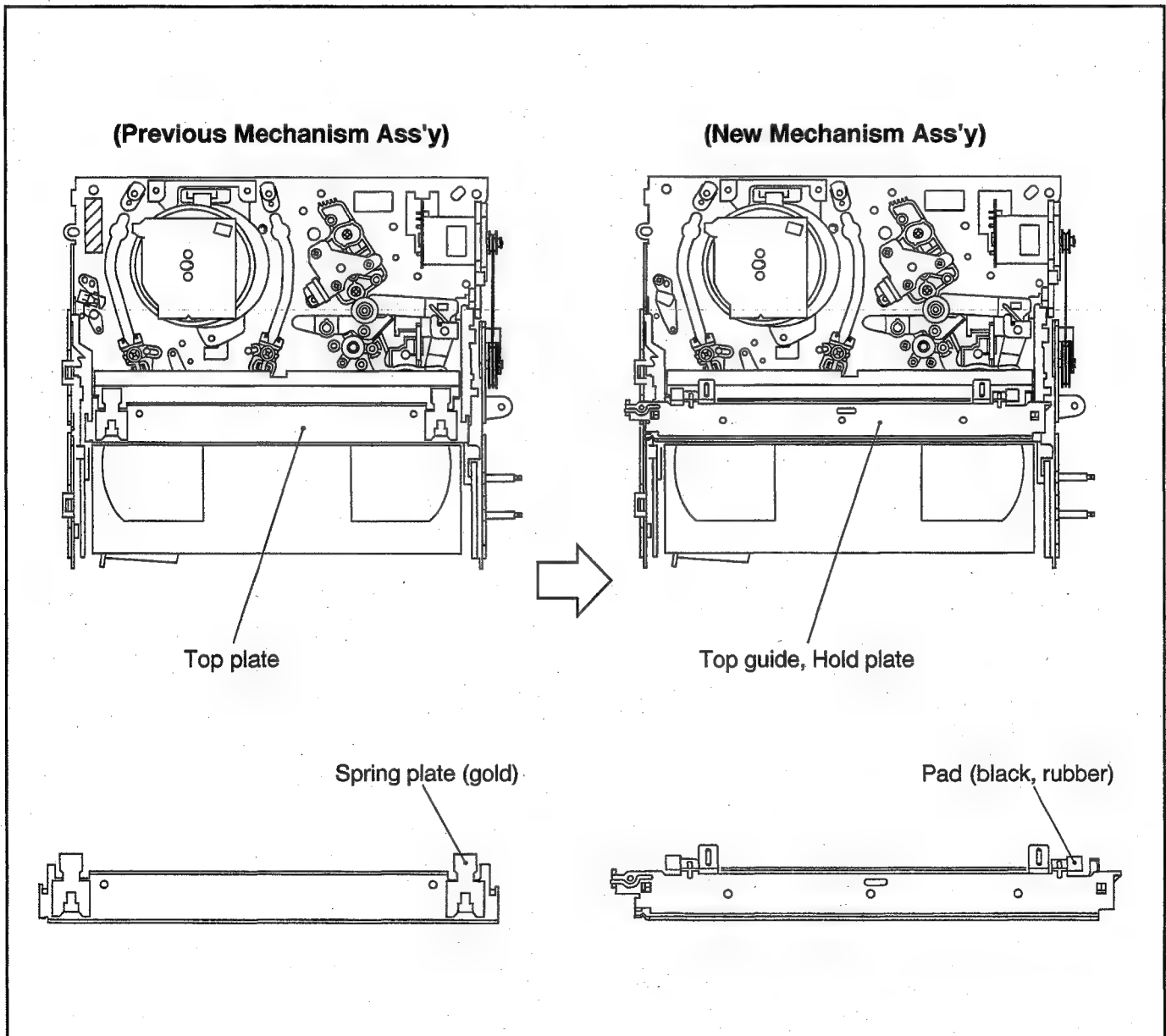
## 1.OUTLINE OF CHANGES

Some of the mechanism ass'y in the VCR mechanism section of this model has been changed. In accordance with the change, different parts must be used. Below are listed the parts changes; note that other parts not listed remain the same.

The figures in parentheses in the page No. indicate the corresponding pages in the SERVICE MANUAL for TV-20240(US&CA).

## HOW TO DISTINGUISH THE MECHANISM ASS'Y OF THE CURRENT MODEL FROM A PREVIOUS ONE.

In the VTR mechanism section of the TELEVIDEO manual, the serial no. of the mechanism assy <M4> has been changed during production. Additional information has been printed in the service manual. The major locations that represent differences between the two mechanism assemblies are indicated below. Check these before executing repairs or part replacements.



**Note:** With regard to any information not specified in this service manual, please refer to the TELEVIDEO service manual.

# SERVICE ADJUSTMENTS(VCR)

## SECTION 2

### MECHANISM ADJUSTMENT

#### 2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

##### 2.1.1 Precautions

- (1) Unplug the power cable of the main unit before using your soldering iron.
- (2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
- (3) Do not randomly handle the parts without identifying where the trouble is.
- (4) Exercise enough care not to hurt yourself, especially your finger nails, during the repair work.

##### 2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE)

##### 2.1.3 Manually Removing the Cassette Tape

###### 1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD)
- (2) Unload the cassette by manually turning the unloading motor of the main deck assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1)
- (3) Bring the pole base assembly (on the supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
- (4) Move the top guide toward the drum while holding down the lug **A** of the bracket retaining the top guide. Likewise hold part **B** down and remove the top guide. The spring plate **C** is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (Note 1) (See Fig.2-1-2).
- (5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
- (6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

**Note:** The spring plate of the top plate is sharp-edged. Take care not to hurt yourself.

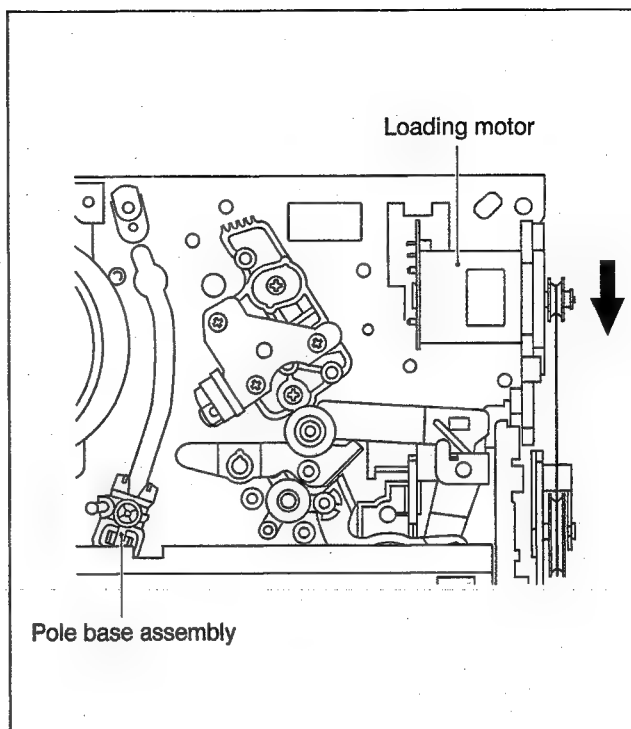


Fig. 2-1-1

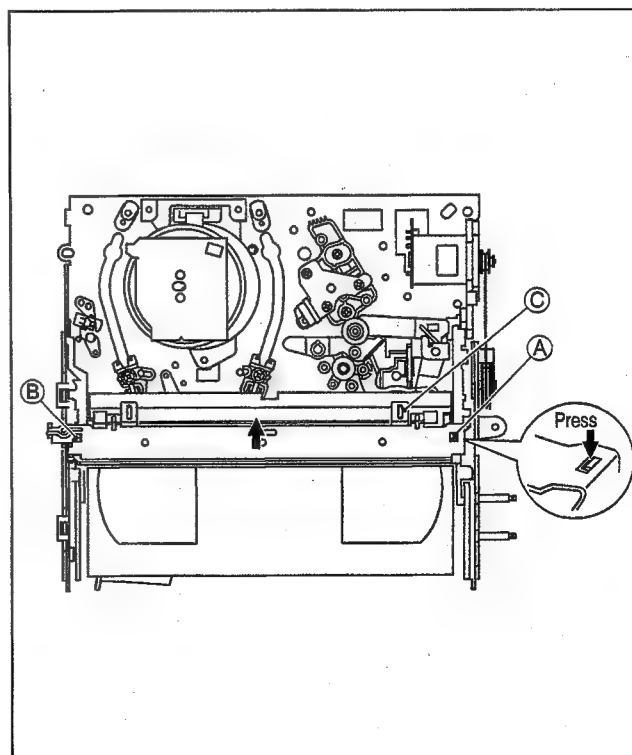


Fig. 2-1-2

## 2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD).
- (2) While keeping the tension arm of the main deck assembly free from tension, pull the tape on the pole base assembly out of the guide roller (on the supply or take-up side) (See Fig.2-1-3).
- (3) Remove the top guide as done in Step (4) of "1 In case of electrical failures" and remove the guide pole cap at the same time. (See Fig.2-1-4).
- (4) While lifting the cassette tape lid, hold the cassette tape case and pinch roller by the fingers and move them toward the loading motor to relieve pressure on the tape. Then remove the tape while taking the cassette case out of the cassette holder. (See Fig.2-1-4).
- (5) Re-place the guide pole cap and take up the slack of the tape into the cassette.

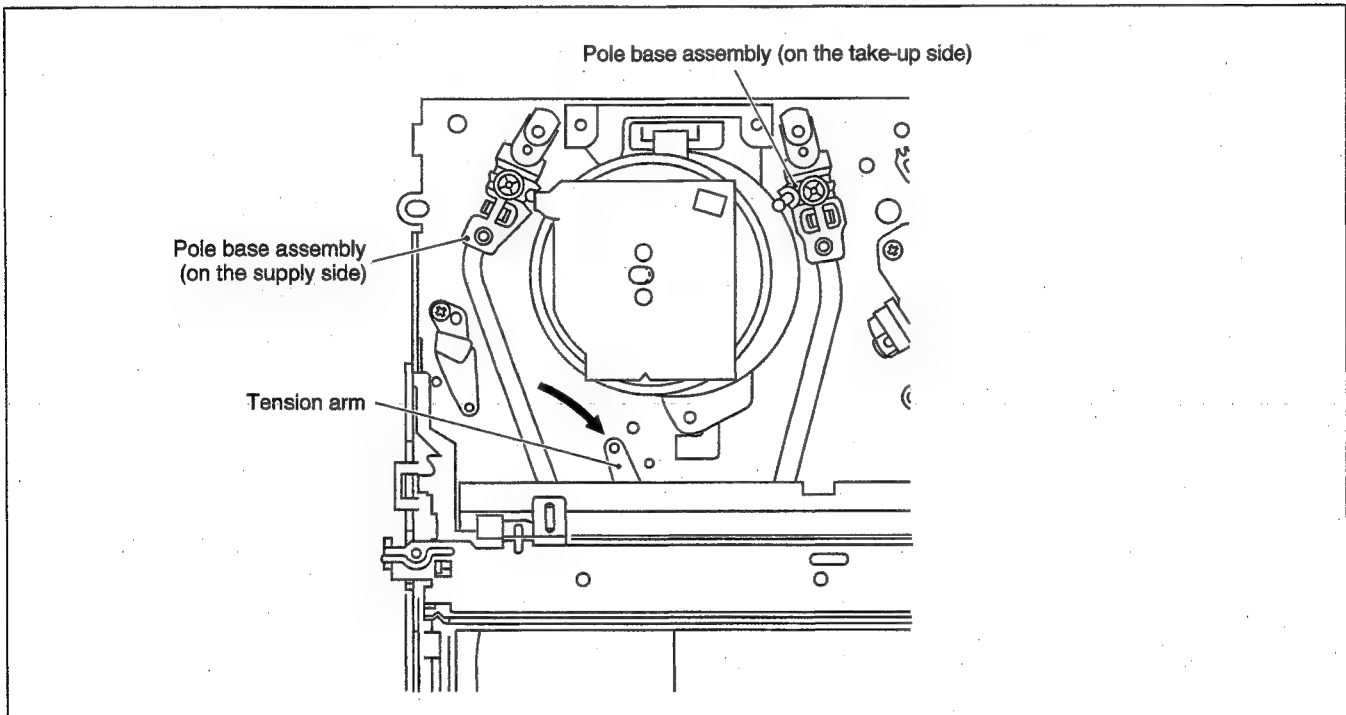


Fig. 2-1-3

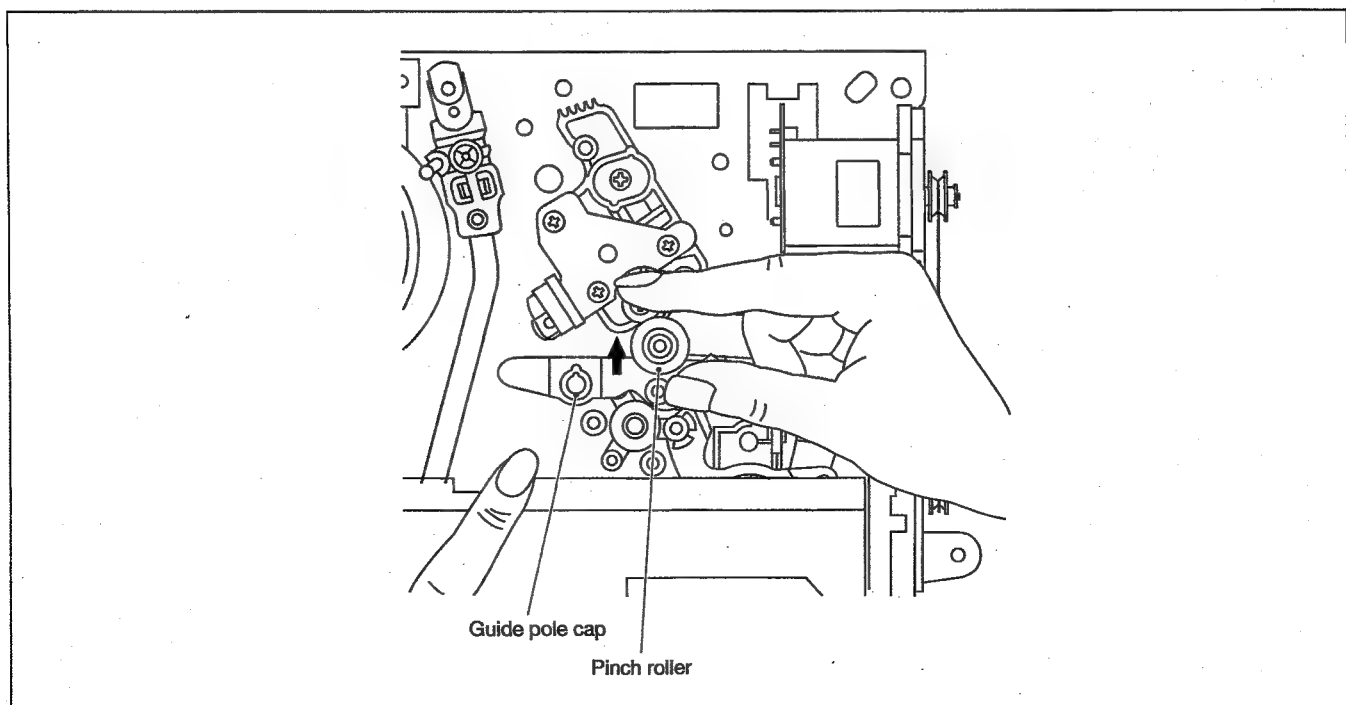


Fig. 2-1-4

No.51520B



### 2.1.4 Jigs and Tools Required for Adjustment

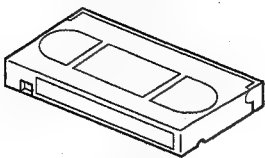
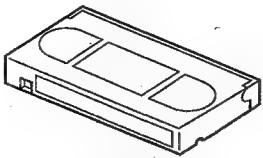
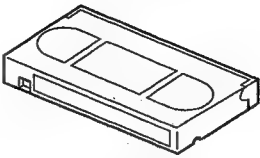

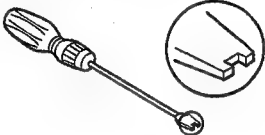
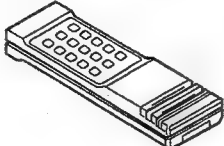
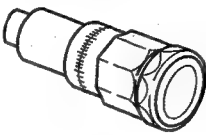
Alignment tape (SP) MHP	Alignment tape (EP) MHP-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

### 2.1.5 Maintenance and Inspection

#### 1. Location of major mechanical parts

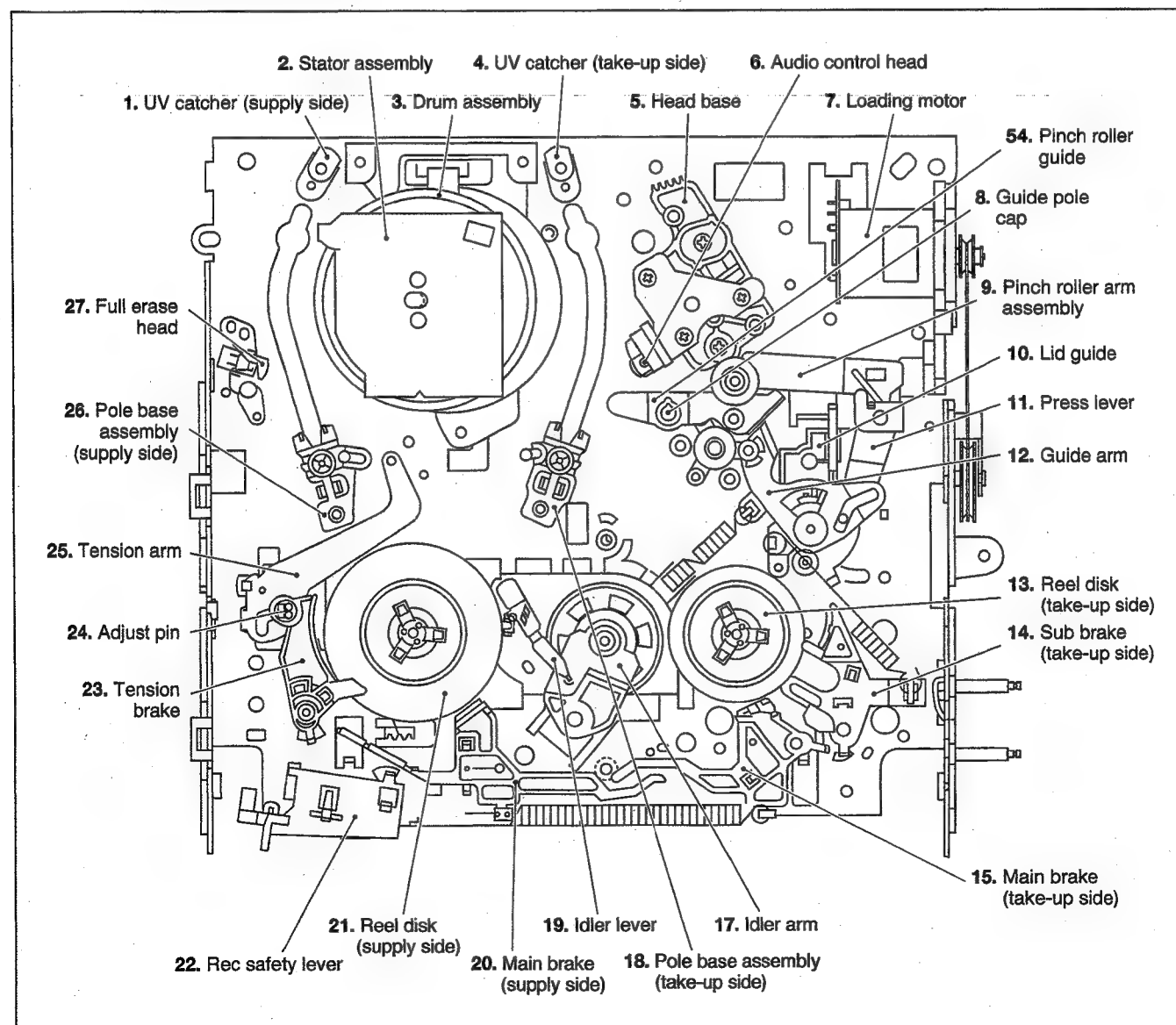


Fig. 2-1-5 Main deck top side

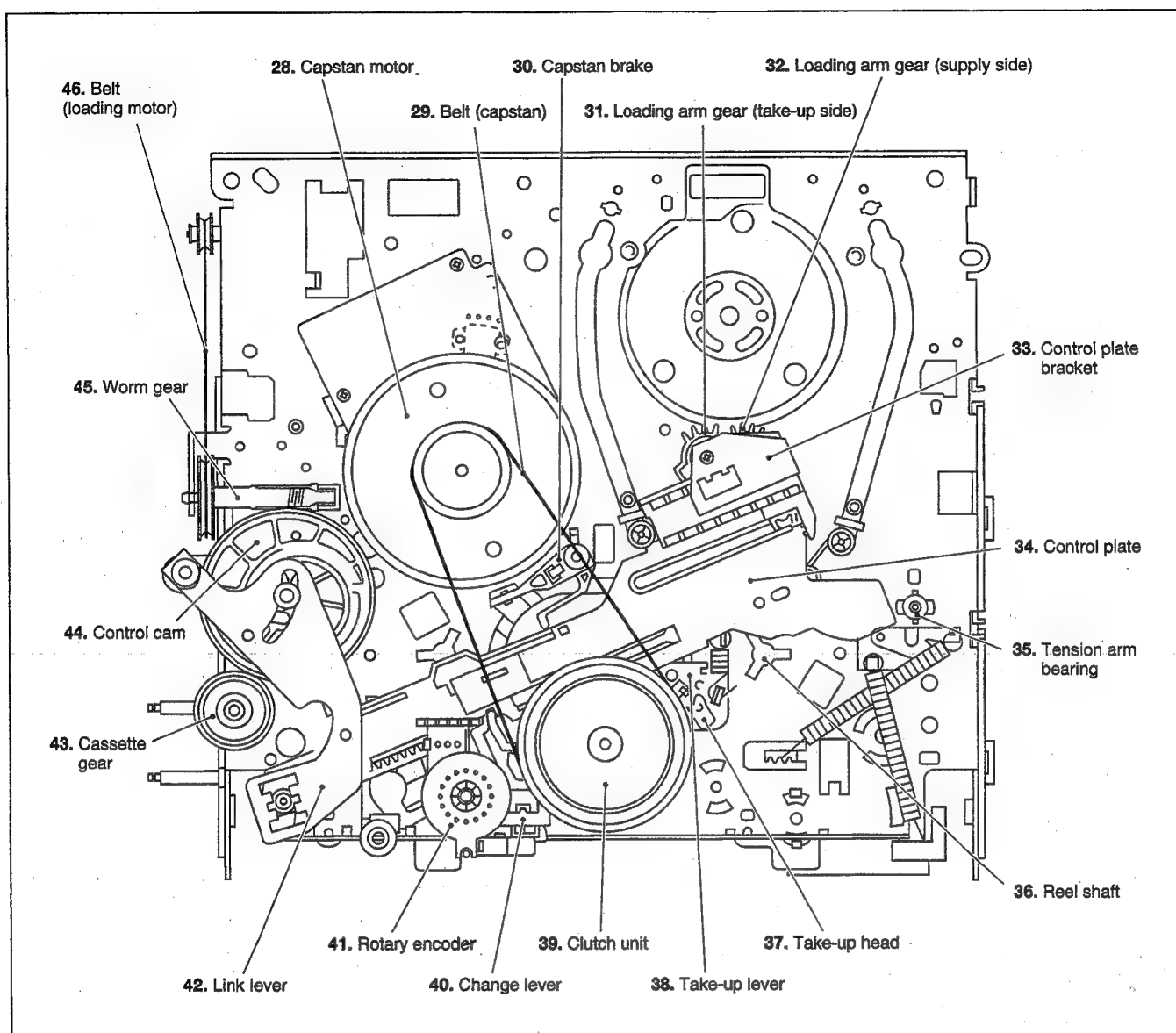


Fig. 2-1-6 Main deck bottom side

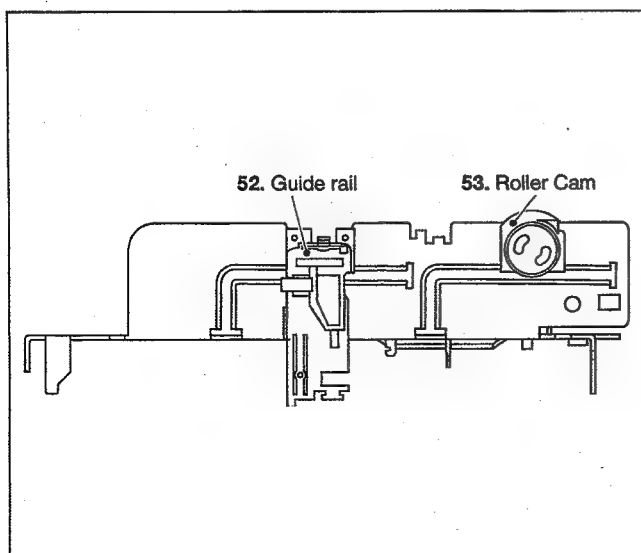


Fig. 2-1-7 Main deck left side

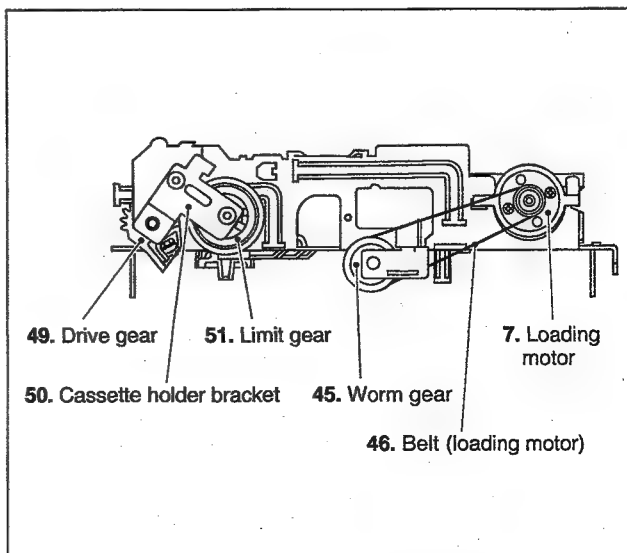


Fig. 2-1-8 Main deck right side

## 2.2 REPLACEMENT OF MAJOR PARTS

### 2.2.1 Before Starting Disassembling

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.

This mode is usually not in use, manually set it when it is required.

### 2.2.2 How to Set the Mechanism Assembling Mode

Remove the main deck assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY). Turn the worm gear toward the front so that the register hole of the control cam is brought into alignment with the hole at the main deck assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1)

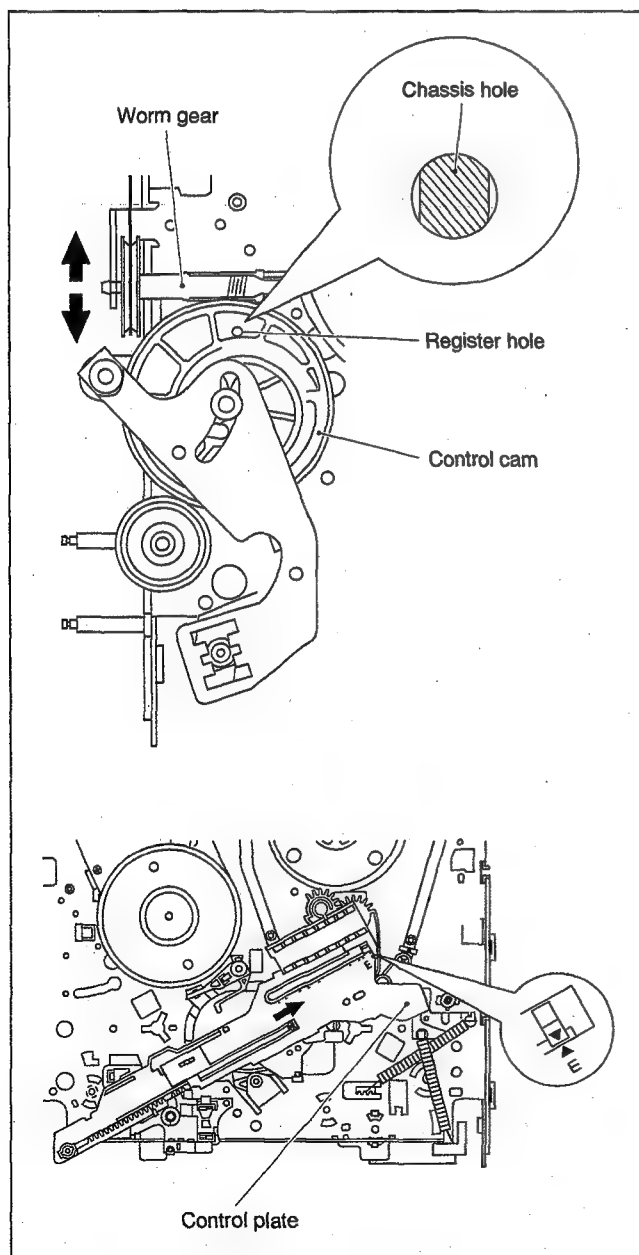


Fig. 2-2-1

### 2.2.3 Cassette Holder Assembly

#### 1. How to remove

- (1) Remove the guide rail and roller cam. (See Fig.2-2-2).  
(3 lugs on the guide rail and one lug on the roller cam)

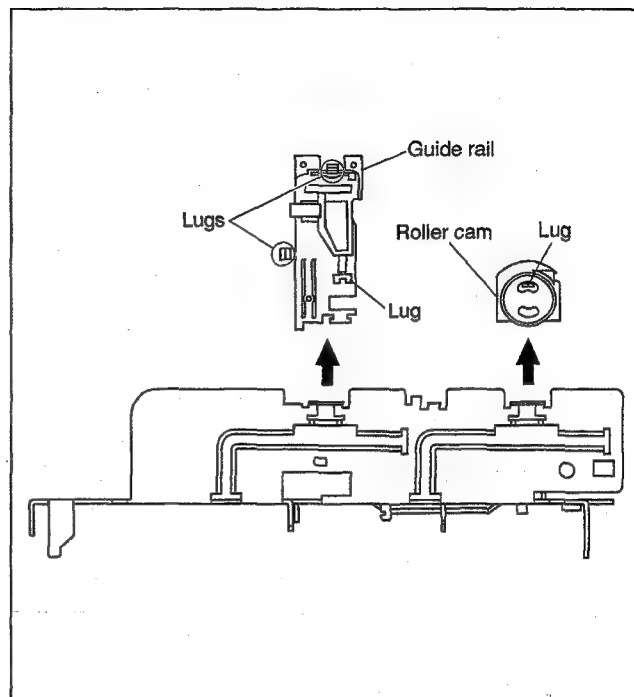


Fig. 2-2-2

- (2) Remove the two slit washers and remove the cassette holder bracket. (See Fig.2-2-3)
- (3) Remove the opener guide, relay gear and limit gear. (See Fig.2-2-3)

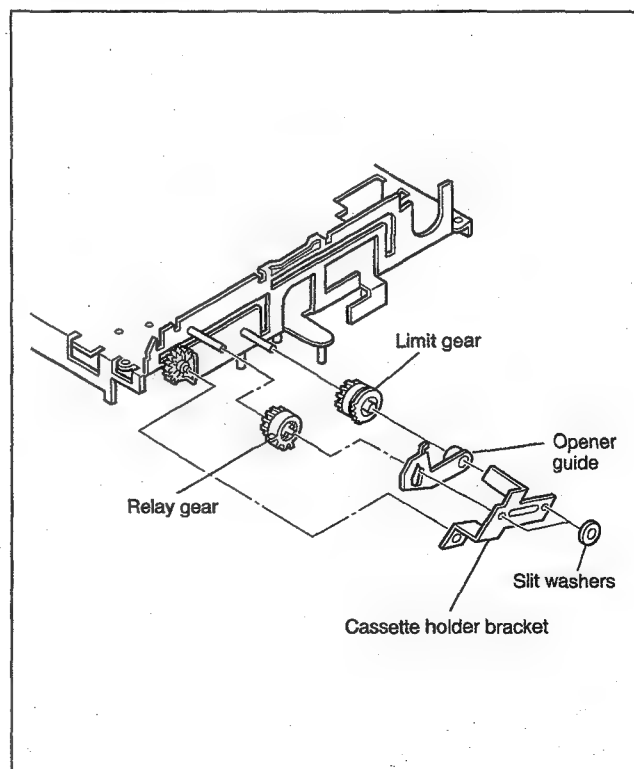


Fig. 2-2-3

- (4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the rail cap have been removed (so that the drive arm is upright). (See Fig.2-2-4)

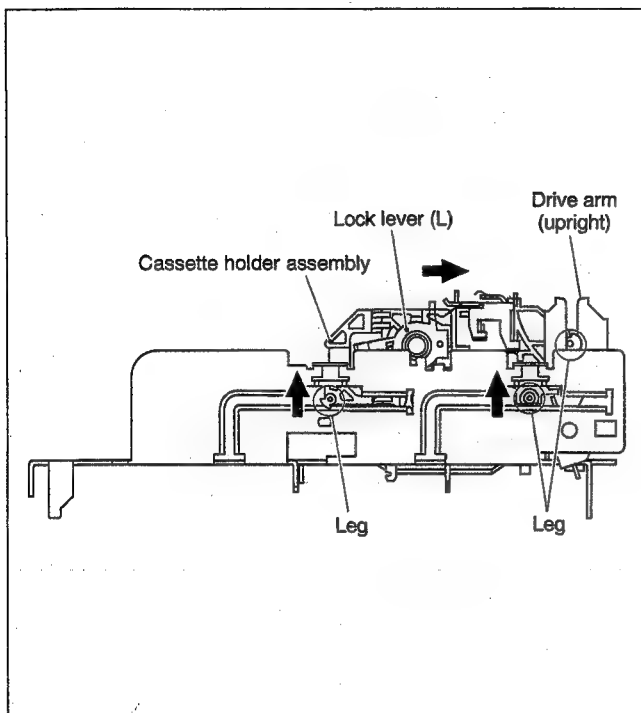


Fig. 2-2-4

- (5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs (A) and (B) on the right side out of the rail and also pull up the leg (C). (See Fig.2-2-5, Fig.2-2-6)

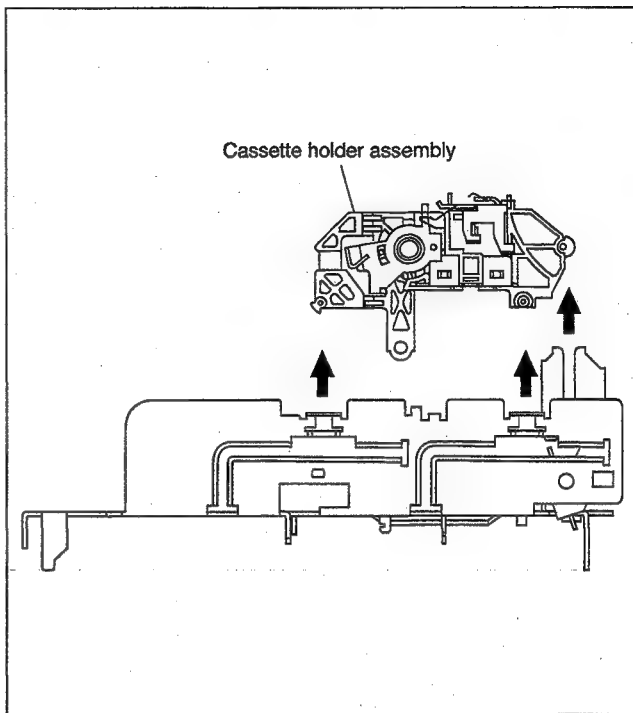


Fig. 2-2-5

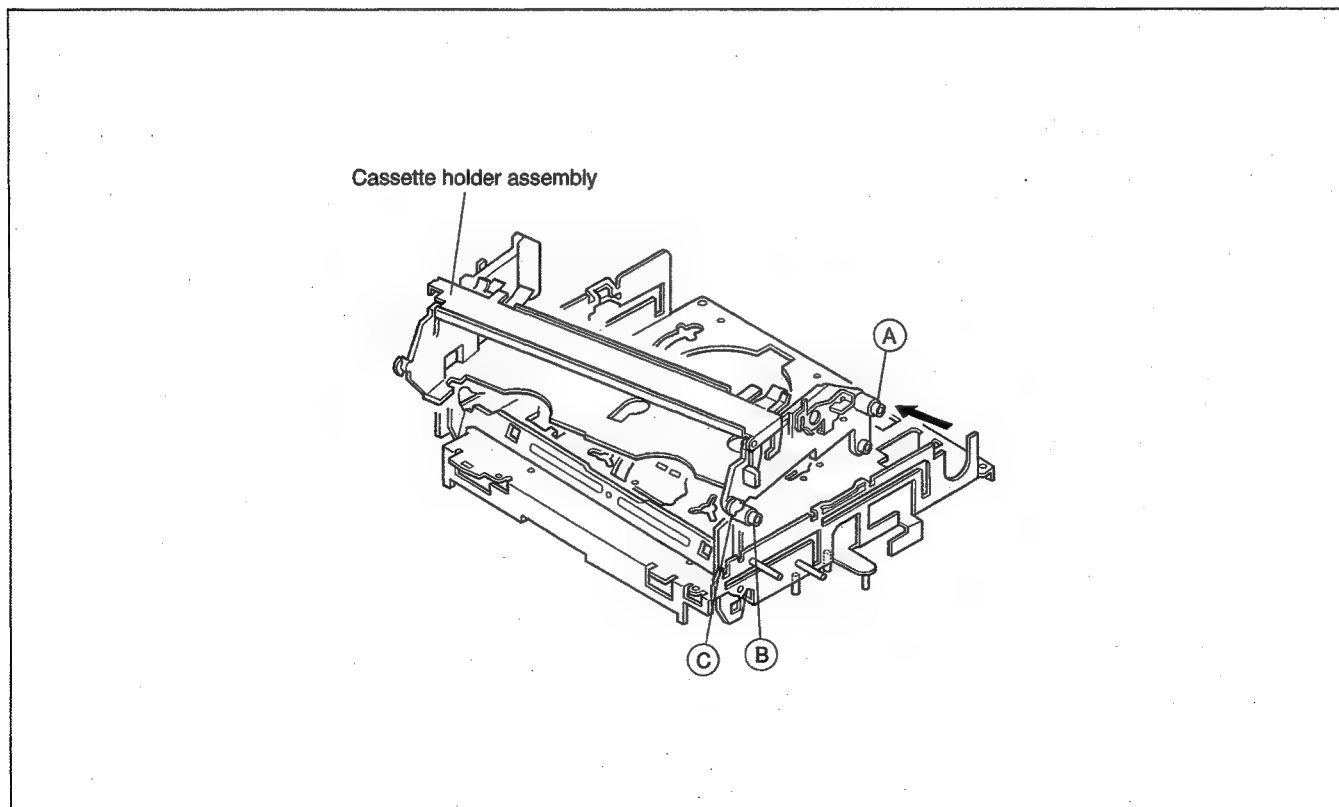


Fig. 2-2-6

## 2. How to install

- (1) Hold the drive arm upright and fit the leg ③ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-7)
- (2) While swinging the lock lever (R) of the cassette holder assembly toward front, put the legs ① and ② into the rail. (See Fig.2-2-7)
- (3) Drop the three legs on the left side of the cassette holder into the groove at one time. (See Fig.2-2-8)
- (4) Slide the whole cassette holder toward the front to bring it to the eject end position.
- (5) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the register hole on the main deck. (See Fig.2-2-9)
- (6) Install the relay gear so that the notch on the outer circumference of the relay gear is brought into alignment with the notch on the main deck. It is important at this stage that the register hole at the limit gear, the register hole at the relay gear and the register hole at the drive gear are all in alignment. (See Fig.2-2-9).
- (7) Install the door stopper, opener guide and cassette holder bracket and fasten the two slit washers.

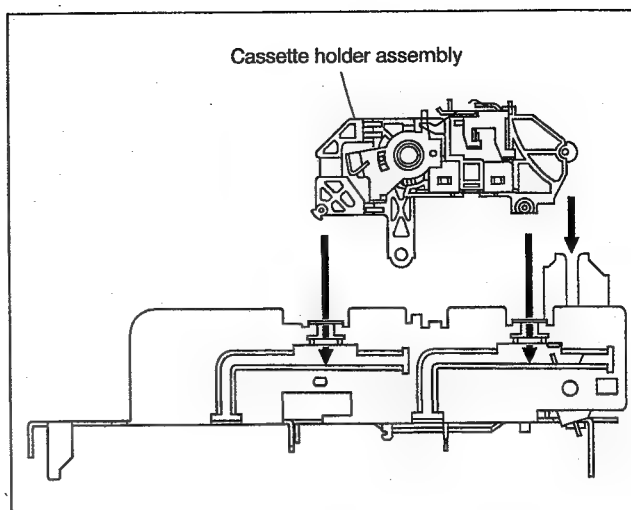


Fig. 2-2-8

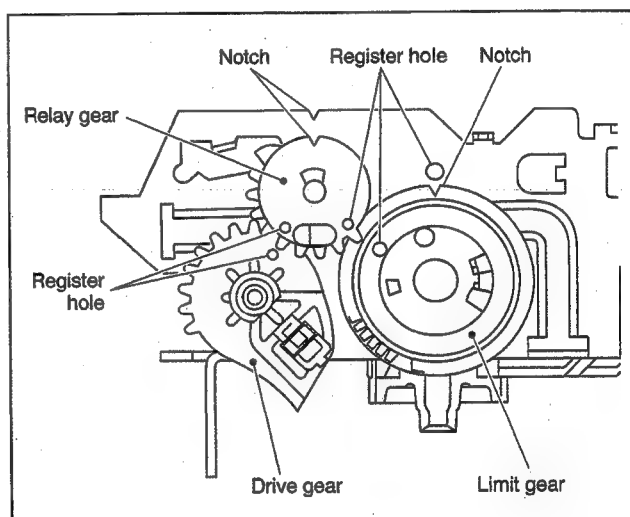


Fig. 2-2-9

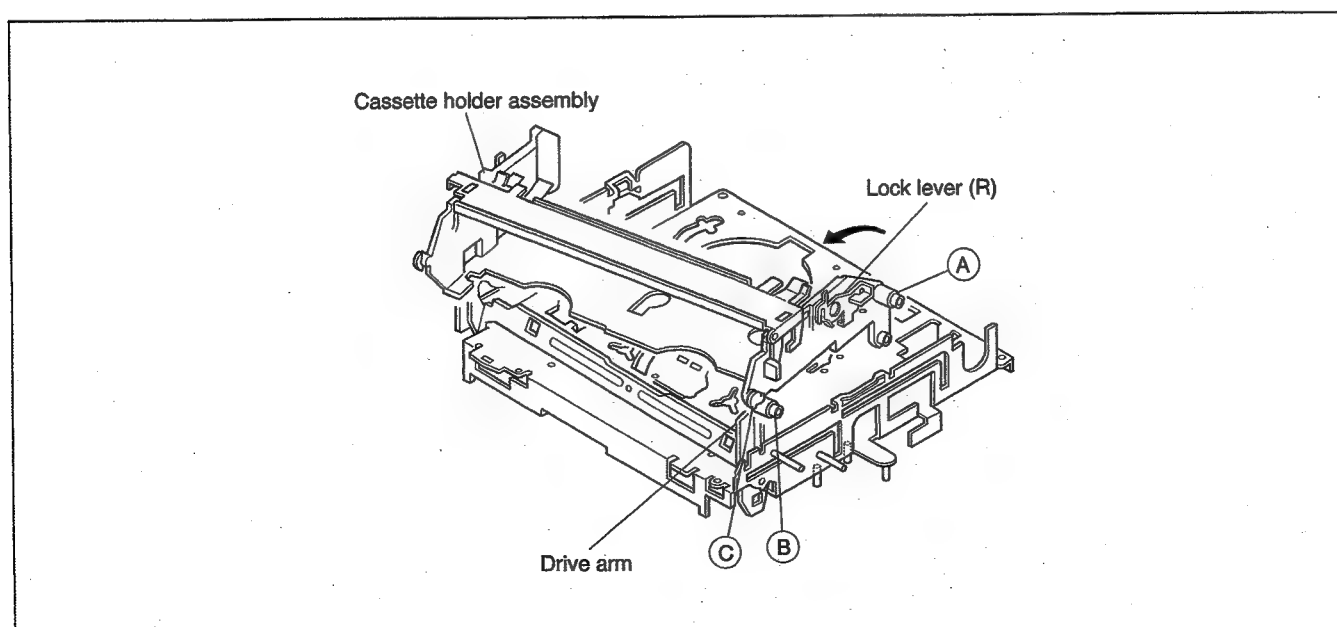
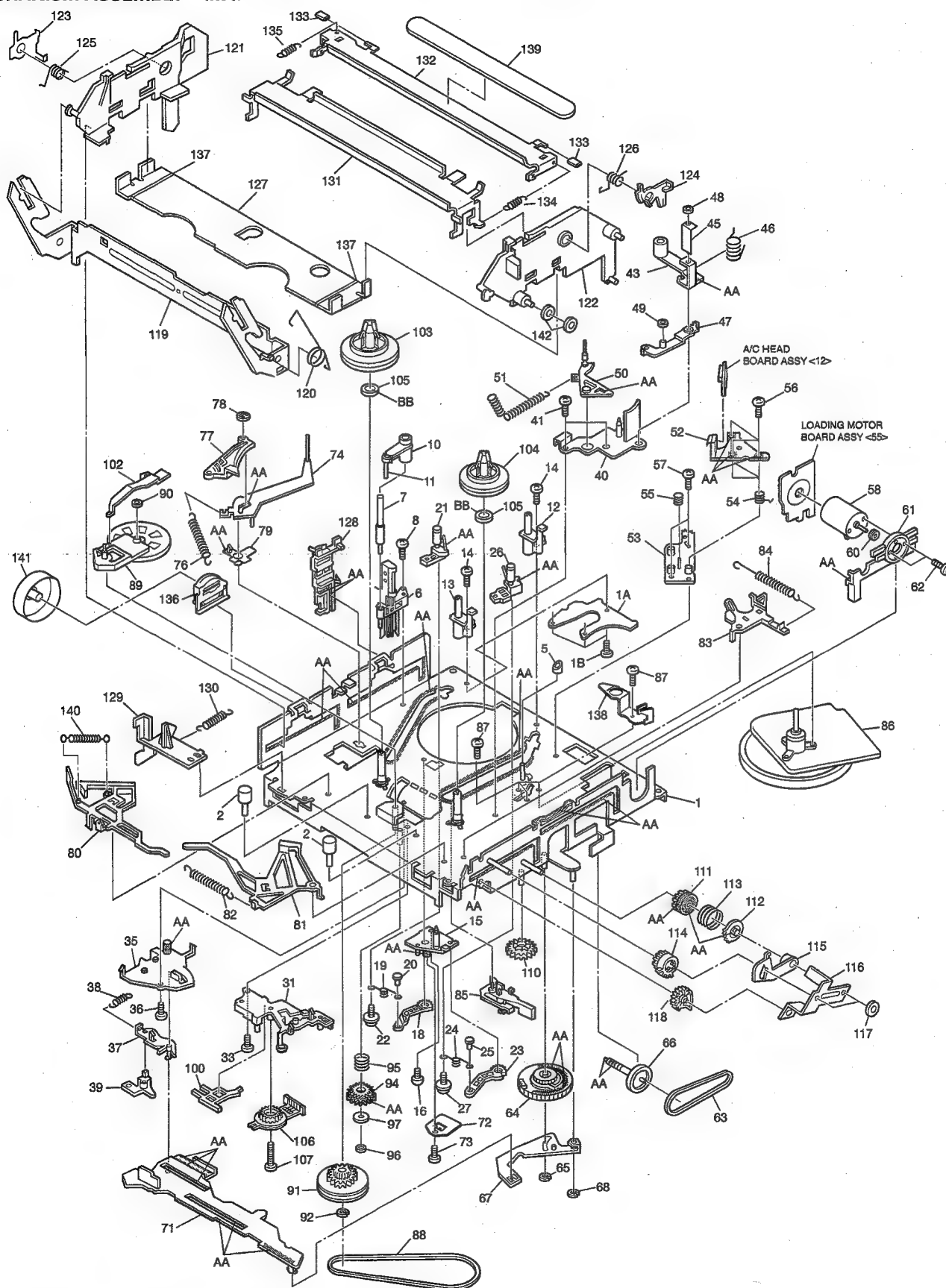


Fig. 2-2-7

# PARTS LIST(VCR)

## 5.2 MECHANISM ASSEMBLY <M4>



Classifi- cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

**NOTE:** The section marked in AA and BB indicate lubrication and greasing areas.

No.51520B

△ REF No. PART No. PART NAME, DESCRIPTION  
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### MECHANISM ASSEMBLY <M4>

1	LP20318-006H	MAIN DECK ASSY
1A	LP40275-001A	PLATE(S)
1B	QYTDST2606Z	SCREW,X3
2	PQ46302-3	ADJUST PIN,X2
3	LP40097-002B	G.POLE CAP
6	NAH0001-001	FULL ERASE HEAD
7	LP40098-001B	GUIDE POLE(S)
8	QYTDST2608Z	SCREW,FULL ERASE HEAD
10	LP30459-003A	T.STUD BASE
11	LP40367-002A	TENSION STUD
12	LP40096-001B	UV CATCHER(S)
13	LP30409-002C	UV CATCHER 2(T)
14	QYTPST2606Z	SCREW,X2 UV CATCHER
15	LP30223-003C	LOADING ARM GEAR SHAFT
16	QYTDST2606Z	SCREW,LOADING ARM GEAR SHAFT
18	LP30224-001A	LOADING ARM GEAR(S)
19	LP40099-001A	TORSION ARM
20	LP40100-001A	PIN,LOADING ARM
21	LP40101-002C	P.BASE ASSY(S)
22	QYSPSTG2606Z	SCREW,POLE BASE(S)
23	LP40103-001A	LOADING ARM GEAR(T)
24	LP40099-001A	TORSION ARM
25	LP40100-001A	PIN,LOADING ARM(S)
26	LP40104-002C	P.BASE ASSY(T)
27	QYSPSTG2606Z	SCREW,POLE BASE(T)
31	LP20233-003K	R.ENCODER GUIDE
33	QYTDST2606Z	SCREW,ROTARY ENCORDER GUIDE
35	LP30226-003C	CTL.PLATE GUIDE
36	QYTPST2605Z	SCREW,CONTROL PLATE GUIDE
37	LP30249-004B	T.UP LEVER
38	LP30003-006A	TENSION SPRING
39	LP40119-002A	T.UP HEAD
40	LP20234-002E	LID GUIDE
41	QYTDST2606Z	SCREW,X2 LID GUIDE
43	LP40105-001B	P.R.ARM ASSY
45	LP40382-001A	P.R.SHEET,P.R.ARM
46	LP40148-002A	TORSION SPRING
47	LP40149-001B	P.LEVER ASSY
48	LP30016-002A	SLIT WASHER
49	LP30017-016A	SPACER
50	LP40106-005A	GUIDE ARM ASSY
51	LP40134-001C	TENSION SPRING
52	QAH0010-004	AC HEAD
53	LP30228-001A	HEAD BASE
54	LP30004-013A	COMPRES. SPRING
55	LP40236-001A	COMPRESSION SPRING
56	LP40213-002B	SPECIAL SCREW,X3 AC HEAD
57	QYTDST2608Z	SCREW,X2 AC HEAD
58	QAR0023-001	LOADING MOTOR
60	PQ43546-1-2	MOTOR PULLEY
61	LP30230-004B	MOTOR GUIDE
62	QYTPSP3003Z	SCREW,X2 LOADING MOTOR
63	LP30005-003A	BELT
64	LP20791-003B	CTL.CAM
65	PQM30017-24	SLIT WASHER,CONTROL CAM
66	LP40120-001A	WORM GEAR
67	LP40107-002A	LINK LEVER ASSY
68	PQM30017-24	SLIT WASHER,LINK LEVER
71	LP10080-002H	CTL.PLATE
72	LP40379-001A	CTL BRACKET(1)

#	△ REF No.	PART No.	PART NAME, DESCRIPTION
73		QYTDST2608M	SCREW,CTL BRACKET(1)
74		LP40108-002A	TENSION ARM ASSY
76		LP30003-010A	TENSION SPRING
77		LP40109-002F	T.BRAKE ASSY
78		PQ46302-3	ADJUST PIN
79		LP30232-002A	T.ARM BEARING
80		LP40110-004D	MAIN BRAKE ASSY (SUPPLY)
81		LP40111-002C	MAIN BRAKE AY (TAKE-UP)
82		LP30003-002A	TENSION SPRING
83		LP40112-002F	S.BRAKE(T)ASSY
84		LP40357-001B	TENSION SPRING
85		LP40113-002B	C.BRAKE ASSY
86		QAR0018-006	CAPSTAN MOTOR
87		QYTDST2608M	SCREW,X3 CAPSTAN MOTOR
88		LP30005-005B	BELT,CAPSTAN MOTOR
89		LP40114-004A	IDLER ARM ASSY
90		LP30016-001A	SLIT WASHER,IDLER ARM
91		LP40115-002D	CLUTCH UNIT
92		PQM30017-47	SLIT WASHER,CLUTCH
94		LP40122-001B	DIRECT GEAR
95		LP40224-001C	COMPRESSION SPRING
96		LP30016-001A	SLIT WASHER
97		LP30017-002A	SPACER,D.GEAR
100		LP30235-002A	CHANGE LEVER
102		LP30236-002B	IDLER LEVER
103		LP40420-001A	REEL DISK (SUPPLY)
104		LP40421-001A	REEL DISK (TAKE-UP)
105		LP30017-010A	SPACER,X2 REEL DISK
106		QSW0554-003	ROTARY ENCODER
107		QYTPST2620Z	SCREW,ROTARY ENCODER
110		LP30237-001B	CASSETTE GEAR
111		LP30239-002F	LIMIT GEAR(1)
112		LP30240-002G	LIMIT GEAR(2)
113		LP40136-001E	TORSION SPRING
114		LP30242-001A	RELAY GEAR
115		LP30339-001C	OPENER GUIDE
116		LP40214-001B	C.H.BRACKET
117		PQM30017-47	SLIT WASHER,X2 CH BRACKET
118		LP30243-001D	DRIVE GEAR
119		LP20240-001C	DRIVE ARM
120		LP40137-001A	TORSION SPRING
121		LP10081-001L	SIDE HOLDER(L)
122		LP10082-001M	SIDE HOLDER(R)
123		LP30255-007A	LOCK LEVER(L)
124		LP30256-003A	LOCK LEVER(R)
125		LP40168-001A	TOR.SPRING(L)
126		LP40218-001B	TOR.SPRING(R)
127		LP30257-001E	CASSETTE HOLDER
128		LP30244-002G	GUIDE RAIL
129		LP30245-002E	REC SAFTY LEVER
130		LP30003-004A	TENSION SPRING
131		LP20578-001C	TOP GUIDE
132		LP30500-001C	HOLD PLATE
133		LP40450-002A	PAD,X2
134		LP30003-012C	TENSION SPRING
135		LP30003-019B	TENSION SPRING
136		LP30497-002A	PLATE GUIDE
137		LP30019-014A	PAD,X2 CASSTTE HOLDER
138		LP30482-001B	P.ROLLER GUIDE
139		LP40518-001A	CAUTION LABEL
140		LP30003-011A	TENSION SPRING
141		LP40443-002B	ROLLER CAM
142		LP40405-001A	SPACER,X2 SIDE HOLDER(R)



## **JVC SERVICE & ENGINEERING COMPANY OF AMERICA**

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<b>Southwest :</b>	10700 Hammerly, Suite 105, Houston, Texas 77043	(713)935-9331
<b>Hawaii :</b>	2969 Mapunapuna Place, Honolulu, Hawaii 96819	(808)833-5828
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<b>Vancouver :</b>	13040 Worster Court Richmond B.C. V6V 2B3	(604)270-1311

# **JVC**

# JVC

## SERVICE MANUAL

### COLOR TELEVISION

BASIC CHASSIS

FC

# TV-20240

(A US & A CA)

Supplementary

Since some details of the TV-20240(US&CA) service manual (No.51520 Mar. 1999) were changed, we are informing you of these changes and of the new descriptions.

## 1. OUTLINE OF CHANGES

Due to the change of production country, some PWB ASS'Y No. of this model has been changed. The CHANGE ITEM given in the next page are listed the PWB No. changes; note that other PWB ASS'Y No. not listed remain the same.

## ■ HOW TO MODEL IDENTIFICATION

TV-20240(A US)	TV-20240(A CA)
<p><b>JVC MODEL NO.</b> TV-20240 <b>TH</b></p> <p><b>AC 120V 60Hz</b> <b>100 W</b></p> <p><b>TELEVISION SCREEN SIZE</b> <b>20 INCHES</b></p> <p><small>FOR HFS MODELS: LICENSED BY TAILOSONICS SYSTEMS UNDER U.S. PATENT NO. 4, 948, 656 AND CANADIAN COUNTERPARTS.</small></p> <p><b>WARNING</b>-TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR DUST.</p> <p><b>CAUTION</b> RISE OF ELECTRIC SHOCK DO NOT OPEN</p> <p><b>CERTIFICATION</b>-PRODUCT COMPLIES WITH DDD RULE 21CXX SUBCHAPTER J APPLICABLE AT THE DATE OF MANUFACTURE.</p> <p><small>MANUFACTURED AT JVC MANUFACTURING (THAILAND) CO., LTD. MADE IN THAILAND.</small></p> <p><small>VICTOR COMPANY OF JAPAN, LIMITED.</small></p> <p><small>12, 3-CHOME, HORIYA-CHO, KANAGAWA-CITY, YOKOHAMA, 221-JAPAN.</small></p> <p><b>MANUFACTURED</b> <b>INDICATED</b></p> <p><b>SERIAL NO.</b> <b>A</b></p> <p><b>INDICATED</b></p> <p><b>TV-20240 AUS</b></p>	<p><b>JVC MODEL NO.</b> TV-20240 <b>TH</b></p> <p><b>AC 120V 60Hz</b> <b>1.5 A</b></p> <p><b>WARNING: SHOCK HAZARD-DO NOT OPEN.</b></p> <p><b>AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.</b></p> <p><b>CABLE COMPATIBLE TELEVISION APPARATUS, CANADA.</b></p> <p><b>TÉLÉVISEUR CÂBLE COMPATIBLE, CANADA.</b></p> <p><small>MANUFACTURED AT JVC MANUFACTURING (THAILAND) CO., LTD. MADE IN THAILAND.</small></p> <p><small>VICTOR COMPANY OF JAPAN, LIMITED.</small></p> <p><small>12, 3-CHOME, HORIYA-CHO, KANAGAWA-CITY, YOKOHAMA, 221-JAPAN.</small></p> <p><small>FOR HFS MODELS: LICENSED BY TAILOSONICS SYSTEMS UNDER CANADA PATENT NO. 1, 128, 542 AND 1, 145, 831 AND U.S. COUNTERPARTS.</small></p> <p><b>CHASSIS NO.</b> <b>INDICATED</b></p> <p><b>MANUFACTURED</b> <b>A</b></p> <p><b>SERIAL NO.</b> <b>A</b></p> <p><b>INDICATED</b></p> <p><b>TV-20240 ACA</b></p>

## 2. CHANGED ITEM

### PARTS DIFFERENCE TABLE

△	REF. No.	TV-20240(US&CA)	TV-20240(A US&A CA)	PARTS NAME	DESCRIPTION
		PARTS No.	PARTS No.		
PARTS LIST (VCR) Page 68					
	(DEMOD BOARD ASSEMBLY)				
	PW1	LPA10050-01B	SFC0A001A-H2	DEMOD PWB ASS'Y	Interchangeable
	(MAIN BOARD ASSEMBLY)				
	PW1	LPA10040-03B	SFC-7001A-H2	MAIN BOARD ASS'Y	↑

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